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WIND TUNNEL INVESTIGATION OF AERODYNAMIC CHARACTERISTICS
OF A SCALE MODEL OF A D5 BULLDOZER AND AN
M109 SELF-PROPELLED 155 MM HOWITZER

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Ву

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And

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SUMMARY

Wind tunnel tests were conducted on a scale model of a D5 bulldozer and an M109 Self-Propelled 155 MM Howitzer to determine the aerodynamic characteristics of these typical externally-suspended heavy lift helicopter cargo configurations. Tests were made over a large range of pitch and yaw attitudes at a nominal Reynolds number per unit length of 1.5×10^6 . This report presents the aerodynamic data obtained from the tests.

INTRODUCTION

Operational requirements of heavy lift helicopters require the transportation of large cargo items at moderately high speeds. The aerodynamic characteristics of such externally-suspended cargo can adversely affect the stability of the helicopter-sling cargo system. A lack of experimental data on typical large cargo items seriously hinders theoretical predictions of the effects of such configurations on the performance and dynamics of the complete system.

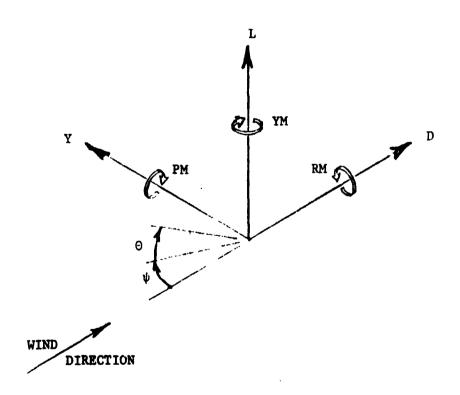
Wind tunnel tests were made on a model of a D5 bulldozer and an M109 Self-Propelled 155 MM Howitzer in the Army Air Mobility Research and Development Laboratory 7X10 Foot Wind Tunnel. The purpose of this report is to present the aerodynamic data obtained from tests on these two models.

NOTATION

- b span
- c chord
- CD drag coefficient, D/qS
- CL lift coefficient, L/qS
- CPM pitching moment coefficient, PM/qSc
- CRM rolling moment coefficient, RM/qSb
- CY side force coefficient, Y/qS
- CYM yawing moment coefficient, YM/qSb
- D drag force

- L lift force
- PM pitching moment
- q dynamic pressure
- RM rolling moment
- Y side force
- YM yawing moment
- θ pitch angle
- ψ yaw angle

Positive Directions as Shown



DESCRIPTION OF MODELS

Two heavy lift helicopter externally-suspended cargo items representative of those currently in wide use throughout the military transport system were selected for this wind tunnel investigation - a D5 Bulldozer and an M109 Self-Propelled 155 MM Howitzer. Models of these two configurations were sized to maximize Reynolds number in the test section for the full range of model pitch and yaw angles. The bulldozer model, constructed with a detachable blade, was 1/5 scile; the M109 model was 1/8 scale. Photographs of each model are presented in Figures 1 and 2. The models were sting mounted and, with the exception of the bulldozer/blade configuration, tested in both a forward and reversed position. Model loads were measured using an internal strain gage balance. Photographs showing the models mounted in the tunnel are presented in Figures 3 and 4.

TEST AND PROCEDURES

The three D5 Bulldozer model configurations and the two M109 model configurations tested in the 7X10 foot wind tunnel are shown in Figures 3 and 4. Except for two tests, the M109 model was tested without the machine gun. Yaw attitude was varied using the tunnel turntable system; pitch attitude was varied using the pitching mechanism of the sting/strut support system. Model aerodynamic loads were measured using an internal strain gage balance; model moment reference center, as shown in Figure 5, and strain gage balance center coincided.

Except as noted, the tests were conducted at a nominal tunnel dynamic pressure of 3591 N/m² (75psf) with a corresponding Reynolds number based on unit length of 1.5x10⁶. Test data were taken varying pitch attitude at constant angles of yaw through a yaw range of -90° to 95°. Negative sting pitch angles were limited to -12° to avoid modelstrut interference effects due to proximity of the model with the strut. The models, including strain gage balance, were rotated 180° on the sting and tested in this inverted position to provide data through a model pitch range of -40° to 40°. As a result of this inversion, two sets of data were obtained in the -12° to 12° pitch attitude range.

Model configurations and attitudes were necessarily held to a minimum on the following additional comparative-type tests. Tests with the machine gun mounted on the M109 model were limited to yaw attitudes of 0° and 90° and a pitch angle range of -12° to 40°. To provide an indication of Reynolds number effect the three forward model configurations were tested at 1197 N/m² (25psf) or a Reynolds number of 0.9x10⁶ based on unit length. These tests were made at a yaw attitude of 0° and through the -12° to 40° pitch angle range. Two tests on the M109 forward configuration were repeated at 0° and 90° yaw attitude through the -12° to 40° pitch angle range for a check on data repeatability.

PRESENTATION OF DATA

The results of the tests on the models are presented in tabular form; tables and model test attitudes are indexed in Table I.

Model aerodynamic data are presented as full scale aerodynamic coefficients; these coefficients are based on unit values for chord,

span, and area to facilitate, upon multiplication by the dynamic pressure, a direct conversion to the aerodynamic loads. The full scale aerodynamic coefficients presented in the tables were obtained by multiplying the model force coefficients by the scale factor squared and model moment coefficients by scale factor cubed. The appropriate constants are listed below.

Model	Force Data	Moment Data
	(scale factor) ²	(scale factor)
D5 Bulldozer	25.0	125.0
м109	64.0	512.0

Forces and moments are resolved with respect to wind axes; moments are referenced to the moment reference center shown in Figure 5. Data from the additional tests (Tables VII, VIII, and IX) are presented, as the aerodynamic coefficients and also include the incremental value between these data and the comparative data from Tables II thru VI. The non-aerodynamic shape of the model, insuing rough tunnel flow and model vibrations resulted in a correspondingly large data repeatability scatter band especially at the more extreme angles. Data from the tests to evaluate the effect of Reynolds number and the effect of machine gun were essentially lost in the data repeatability scatter band. Since model testing positions were selected to exclude those regions necessitating model-strut interference effect corrections, none are accounted for in the data.

To provide a visual indication of the aerodynamic characteristics

of the five configurations tested, some data were selected from Tables
II through VI and plotted. These data are presented in Figures 6 through
10. Parts (a) and (b) of each of these figures present the force and
moment coefficients plotted against pitch angle at 0 degrees yaw angle.
The force and moment coefficient variation with yaw angle are shown in
parts (c) and (d) for pitch angles of -16, 0, and 16 degrees.

TABLE I. - INDEX TO DATA TABLES

ARLE NA.	TITLE	PITCH ANGLE RANGE, DFG.	YAW ANGLE POSITIONS, DEG.
=-	DS BULLDOZER FORWARD CONFIGURATION	-46 70 40	-90,-60,-30,0, 4,8,16,30,60, 75,90,95
111	DS BULLDOZER/BLADE CONFIGURATION	-40 TU 40	-90,-60,-30,0, 8,16,30,60,90
2	DS BULLDOZER REVERSE CUNFIGURATION	-40 TO 40	-90,-60,-30,0, 4,8,16,30,45, 60,75,90,95
>	M109 FORWARD CONFIGURATION	-40 TU 40	-90,-60,-30,0, 4,8,16,30,45, 60,75,61,05
<u>-</u>	MING REVERSE CONFIGURATION	-40 TU 40	-90,-60,-30,0, 4,8,16,30,45, 60,75,90,05
11 >	MIGG FORWARD CONFIGURATION WITH MACHINE GUN	-12 TD 40	00.0
	REYNOLDS NO. = .9 X 104*6 DATA	-12 TO 40	0
×	MING FURWARD CUNFIGURATION DATA REPEATABILITY CHECK	-12 TG 40	00•0

TABLE II.- DS BULLDÜZER FORWARD CONFIGURATION

DE G.

YAW ANGLEE -90.

NTCH	LIFT	•	DRA	(9	SIDE		PITCHING	ING	SNIMAY	9	CNI	2
ING. E	FORC	M	FOR	Ą	FORCE	'n	MOMENT	L		; -	FNEWCM	; ; ;
(DEC.)	COEF.	•	COEF.	•	COEF.	•	COEF	•	COEF.		CUEF	. •
• 0 •	•		61.4		-11.6		35.9		74.5		4,00	
-35.	3.5		61.0		-10.2		28.8		76.9		20.0	
-30.	4.6		60.09		-9.7		22.1		80.1		27.4	
-88-	***		61.5		0.8		14.6		80.5		24.5	
-80.	5.7		60.7		-9-1		7.6		80.4		20.00	
-101-	8.1		60.2		9		3.0		80.7		22.1	
-12.	6.d	5.3	61.0	57.6	-8.2	-8.1	-2.6	-5.2	80.0	83.2	24.3	26.8
-8-	0.0	7.8	•	~	7	-7.8	-7.1	-10.3	81.0	Œ.	16.7	25.1
•	2.0		•	Ň	-7.2	8.6	-13.4	-15.9	79.6	R2.7	10.5	. a.
•	10.0	6. 5	60.7	~	4.2	٠ <u>.</u>	-18.9	-19.7	77.77	e. e.	18.7	21.5
*	10.0	7.8	•	60	7·9	5.5	-23.6	-26.9	77.3	77.8	10.8	7.50
	11.0	8.4	•	Ň	ب د.	2.5	-29.3	-32.1	76.0	75.9	18.1	27.0
**************************************	10.7	10.5	60.3	6	4.7	7	-34.8	-36.2	73.5	74.0	18.0	a
	,	1.6		58.0		7		-41.7		70.3	•	α. 4 <i>C</i> .
20%		9.1		o		-3.9		-46.7		60.2		7.70
		11.2		a		-1.5		-53.4		64.1		0.00
Å		9.2		0		-2.9		-56.8		0.80		α α α α
100		11.0		Ľ		1.1		-61.1		53.2		22.1
• • •		11.4		59.5		1.4		-65.6		40.6		ν. Ν.
,												

TABLE 11.- D5 BULLEGLER FORWARD CONFIGURATION (CONTINUED)

	YAW ANGLEs -60.		• 0								
M2110	1. 16.1	DR	9	S IDE	į,	PITCHING	SN 1	CAIMAY	<u>ن</u>	POLLING	S Z
	FORCE	JOH.	FORCE	FORCE	C.E.	MOMENT	F 7	MOMENT	11	HUBMUM	Ti
(0.60)	COEF	COEF	## •	COEF.	ė ik	COEF.	•	COEF.	•	COEF	.•
		73.6		-26.6		12.2		63.8		-17.1	
		•		-26.2		0.9		65.0		-16.9	
		6.69		-26.6		-2.3		58.5		-16.8	
		69.1		-25.5		-7.4		51.5		-4·2	
	200	0.69		-25.7		-14.4		43.7		0.3	
	9.8-	67.3		-25.7		-16.2		38.3		7.2	
		7 67.5	66.3	-26.2	-28.4	-20.5	-20.0	31.3	23.5	0	17.3
		3 66.6		-27.0	-28.8	-23.1	-24.8	23.7	16.8	15.2	a .
		•	64.7	-26.9	-27.7	-24.6	-29.3	16.7	13.4	19.5	17.1
	· M	•	63.	1.02-	-26.6	-30.0	-31.6	14.1	œ.	18.0	r, • 0
, 7,	4.6	90	63.6	-24.4	-25.3	-32.4	-34.6	8.5	6.1	50.6	22.4
		8 64.	•	-23.7	-23.9	-34.6	-33.3	4	1.3	25.5	7 8 °
		.2 63.8	63.5	-22.4	-23.6	-35.2	-28.8	£*0	-4.5	26.3	36.3
			•		-22.3		-24.5		1.6. B		44.5
	61		•		-20.5		-21.3		A.C.		α • α: α
, a	151	en e	•		-18.3		-17.4		-11.6		٦٠١ • لا
6	7	•			-15.6		-15.5		-12.0		40.0
	7	, FO	•		-12.9		-16-1		-11.3		4 A A
.04	20.		9. 99		4.6-		-24.2		4.4-		4 F & O
!											

TABLE 11.- DS BULLDOZER FORWARD CONFIGURATION (CONTINUED)

The state of the s

DEG.
-30
ANG.E=
3

DITCH		-	ORA	و	SIDE	ليا	PITCHING	1 NG	- N - N - N - N - N - N - N - N - N - N	<u>.</u>		0
A NEEL F	FOR	KE	FORCE	CE	FORCE	ĆĒ	MOMENT) 	MOMPNT	; <u>+</u>
(DEC+)	COEF.	. T.	COEF.	•	COEF.	· L	COEF.		CDEF.	•	COFF	. •
•	-20.0		67.4		-18.9		3.1		25.7		10.6	
-35.	-18.4		62.7		-21.8		3.0		27.4		13.9	
-30.	-15.2		58.9		-23.3		0.5		33.8		13.1	
-25.	-15.3		56.3		-23.9		-10.8		32.8		17.0	
-20.	-20.4		55.3		-22.4		-17.7		30.3		32.3	
-16.	-10.0		53.6		-22.3		-14.9		25.4		K 0 *	
-12.	-15.6	-11.2	51.0	50.4	-23.1	-25.5	-15.2	-13.0	18.3	14.4	42.0	41.2
*	-10.0	-7-1	40.7	49.2	-23.2	-25.2	-11.3	0.8-	10.9	7.1	41.14	30.5
•	ののトー	-2.0	47.0	47.3	-23.5	-26.3	74.5	4.4-	2.9	0.0	40.0	36.7
•	0.48	2.2	45.9	46.2	-23.2	-25.2	3.4	1.2	0.3	-3.5	40.1	33.4
	2.8	10.2	45.6	-	-22.0	-24.1	8.1	3.1	-3.1	0.4-	36.0	28°0
6 17 7	11.1	17.0	40.4	-	-21.1	-22.2	12.5	7.5	-1.6	-2.6	32 a	27.K
22.	17.1	23.2	47.1	-	-18.1	-20.4	14.9	8.1	0.0	4.8-	40.05	24.2
9		29.2		•		-17.1		6.7		-7.2		7.40
*0.4		34.7		_		-14.2		6.3		-11.3		0 % W
		40.0		56.8		-11.7		4.2		-11.4		a. 00
.0A		44.9		•		0.8		6.0		-11.8		10.
35.		47.7		0.99		m• #		-3.6		-11.2		16.4
40.		47.3		69.3		9.5		8.9-		0.01		14.7

TACLE 11.- DS BULLDGZER FORWARD CONFIGURATION (CONTINUED)

·	. YAW ANGLE	E = 0.	0EG.	_								
PITCH	LIFT		DRAG		SIDE		PITCHING	NG I	YAWING	ی	ROLLING	(<u>;</u>
ANGLE	FORCE		FORCE	'n	FORCE	ш	MOMENT	- 7	MOMEN	-	MOMFNT	-
(DEG.)	COEF.		COEF	.•	COEF.	•	CO E	•	COFF	•	COFF	•
•	-31.3		47.3		0.5		-26.5		1.5		1.1	
· 600-	-31.6		43.3		0 8		-33°A		J. 0-		1.3	
• 0 m	-31.1		39.1		-0 -2		-33.5		0.7		ر و ار	
-55.5	-29.4		34.4		0.5		-26.8		4.0-		σ •	
-50-	-25.5		29.8		0.2		-17.6		-1.6		0 • 7	
-16.	-21.9		26.9		8.0		-8.6		-1.7		ر. د	
-12.	•	13.6	25.1	24.4	7.0	₩.0-	8.0-	3.5	ر. 1	6.1	ر. بر	0.7
Ë	-14.5 -	9.6-	23.2	•	0.2	-0-1	8.3	10.2	E.0-	0.1	y • c	0.7
1	-10.0	•	21.4	22.2	0.0	-0.2	16.8	18.1	j.	۳,	1 • G	V • V
ò	-5.2	1.3	21.0	•	9.0	-1.2	22.6	24.8	ر. د.	φ α	m, •	· .
•	0.0		20.4	•	1 • 8	-0-1	25.8	27.5	1.0	K • 7	ر 4 •	-
¢	5.4	7.8	21.1	•	0.5	-0.3	29.3	35.1	-0-1	2.1	-1.1	ر. د.
12.	1 6.9	2.6	21.9	•	1.0	0 . 0-	41.0	39.7	1.2	α	ر • د	را د
16.		6.5		•		0.0-		39.1		4.		C
20.	N			•		1.5		38.2		۲•۰		2 ° E
25.	~	16.7		•		-0-1		44.4		رب د -		۳, •
30.	P)	33.6		•		0.3		30.1		L'. • I –		<u>,</u>
	F 7	38.2		•		2.1		26.5		O M.		C • u i
•0•	m	39.8		•		1.3		8.1		1.0		-1.7

TABLE II. - DS BULLDOZER FORWARD CONFIGURATION (CONTINUED)

	YAW ANGLE=	4	DE G.									
PITCH	LIFT		DRAG		SIDE		PITCHING	92	RANING	٢	POLLING	ن ک
A NGL E	FORCE		FORCE	m	FORCE	•••	MOMENT	E	MOMENT	<u> </u>	MUMF	Ļ
(DEG.)	COEF.		COEF.	•	COEF.	•	COEF.	•	COFF.	.•	CHFF	•
•0	-29.7	-	6		2.7		-18.9		-11.2		w •	
-35.	-30.8	•	45.2		2.2		-24.7		0.8-		1.2	
-30.	-30.7	-	42.1		4 •3		-26.0		7.4		0.0-	
-25.	-28.6	- •	38,3		5.1		-20.5		-7.0		€ ° C	
-20•	-24.1	-			6.3		-11.0		-7.1		-2.1	
-16.	-20.3	٠			5.7		-1.8		-13.2		-2.R	
-12.	-18.0 -14	•	28.8	25.0	5.6	3.5	8.0	-1.8	-14.1	-3.1	€. 8.5	0.
-8-	-14.4 -10.	0		N	4.7	2.6	15.6	5•3	-11.5	4.0	۲۰ ۵۱	1.1.
•	9-8-6-	6	24.5	21.2	3.9	3.1	20.6	13.5	-8.8	1.0	-1.5	-1.1
•	0- 6.4-	6.	23,3	-	3.5	4.0	26.4	18.8	-6.8	10.5	æ-8-1	10.7
•	-0-1 3	.7	•	-	5.1	4.6	32.8	76.4	7.4-6	c • c	0.4-	C • M.
•	Ę.	4.	22.9	22 • 1	5.4	6.4	42.5	34.3	-0 · B	٥.	-4.3	0.01
12.	8.6 11	.7	•	m	4 •6	6. 4	46.1	38,2	11.3	4.6	-3.7	0.41
16.	18	.		26.4		5 • ċ		39.4		٦,٦		7.7-
20.	24	4.		30.2		4.4		38.0		-1.7		A. A.
25.	50	9•		S		6.4		37.8		0.0		y • W
30.		6		44.3		4 • 4		29.5		4 · U-		ն՝ • C
93.	37	. 7		6		2.		25.5		· ·		0.01
0	4	4.		57.5		-1.7		4.0		4 • 5		7.4

TABLE 11.- DS BULLDOZER FORWARD CONFIGURATION (CONTINUED)

	YAW ANGLE=	NGLE=	8. DEG.	•								
PITCH	LIF	-	DRAC	IJ	SIDE		PITCHING	SN 1	NAWING	ن ع	BULL ING	1 MG
ANGLE	FORCE	CE	FORCE	T.	FORCE	11.7	MOME	⊢ 7	MOMENT	⊢ 2	LVIMUM	⊢ Z
(DEG.)	COE	• •	COEF	•	CUEF	•	COEF.	•	COE	•	COFF	•
-40	-28.6		o.		2.4		7.6-		-15.2		7.0	
-35.	-30.0		49.1		5.8		-18.6		-15.2		€.	
-30•	-29.0		•		8		-22.3		-13.6		0.6	
-25.	-26.6		o N		9.6		-18.9		-11.5		1.8	
-50.	-22.1				9.1		6.5		-17.4		-1.4	
-16.	-19.6		4		10.2		0.0-		-21.9		C. W.	
-12.	-17.5	-14.9	o.	6	10.2	7.6	7.9	7.7	-23.7	-17.0	15. A	F 4 9 F
•8•	-14.3	•	30.3		6.6	7.0	17.0	17.6	-20.7	-16.1	16.2	u•4-1
*	9.6-	-5.9	28,3	25.5	0.6	9•9	23.2	19.4	-19.3	18.0	0 · K.	C • ¥ 1
•	-5.0	•	9	4	0.6	7.1	28.8	21.0	7.5	4.4-	-6.4	4. € 4.
*	0.5	3,1	25.5	m	9 8	8.1	32.3	29.6	-5.0	-1.6	16.7	7.6.5
¢	4.9	•	26.4	ທ	10.0	9.1	37.2	34.5	-3.7	-0 - 5	σ•α-	u a 1
12.	10.0	•	7.	7	11.1	10.8	41.5	40.0	-2.3	6.4	-11.1	α 1
16.		19.1		α		11.9		36.1		0.7		1.01
20.		9		ď		12.0		35.2		4.0-		-10.A
25.		21.9		4		11.9		47.1		-1.0		1.0.E
30.		3	•	S.		9.1		25.4		0.0		4. • 4. I
35.		37.8		52.1		4.7		19.1		-1.1		۴.
•0•		•		59.1		1.3		10.5		۳. د د د ا		7.7

TABLE 11.- D5 BULLDOZER FORWARD CONFIGURATION (CONTINUED)

のでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmの

	YAW AP	YAW ANGLE= 1	16. DEG.									
PITCH	1917	l e-	DRAC	(9	SIDE		PITCHING	92	YAWING	ပ Z	ROLL ING	UNU
ANGLE	FORCE	E	FORCE	Ä	FORCE	Ů.	MOMENT	Ļ	MOMENT	FZ	MOMENT	- 7
(DEG.)	COEF.	•	COEF	•	COEF.	•	COEF.	•	CUEF.	• L	COFF	•
-40.	-27.7		59.2		12.5		-4.5		-17.3		-0.2	
-35.	-26.8		56.2		14.8		-14.4		9.6-		m • 0	
-30.	-26.9		53.4		16.9		-21.0		-10.8		1 • 1	
-28.	-20.6		48,5		18.8		o. 8		-25.5		0.0	
-20.	-19.2		45.6		20.1		4.5		-26.6		-3.7	
-16.	-19.0		42.8		19.6		1.0		-30.8		6.6-	
-12.	-16.8	-12.8	39.9	•	18.3	15.5	8.7	9.1	-28.2	-24.7	-13.1	-10.1
-8-	-14.0	-8.5	38.1	•	16.5	14.4	15.5	13.4	-24.3	-21.6	114.6	0,0
7	-7.1	-1.4	36.8	•	17.0	15.4	15.3	4.6	-21.A	-20.1	-14.0	4.0-
	-0.0	4.7	ο,	•	16.9	15.5	17.0	10.5	-17.4	-12.9	-15.0	α. c.
	0.4	10.2	34.7	•	17.4	16.4	21.6	15.2	-12.0	-10.1	-16.0	-12.7
9.	0.0	16.3	34.4	•	16.9	16.6	25 • 1	16.9	-7.2	0.4-	-17.6	-13.0
12.	15.2	21.2	36.6	36.6	17.8	16.6	59.6	20.0	-2.6	0.1-	-10.0	-16.0
154		26.1		•		15.8		22.1		0.4-		-16.4
20.		30.7		•		14.0		21.2		7.5-		-12.6
20.00		34.4		•		13.7		16.0		1.2		7.7-
30.		36.6		•		10.1		15.1		o • v		-1.7
35.		41.5		•		7.3		9.1		¥.		c -
+0+		45.5		•		5.6		2.7		2.5		3.4

TABLE 11.- DS BULLDOZER FORWARD CONFIGURATION (CONTINUED)

PITCH	LIFT	-	DRAG	(9	SIDE		PITCHING	ING	YAWING	ე Z	RULLING	ING
ANGLE	FOR	CE	FOR	E	FURCE	m	MOMENT	۲	MOMENT	+ 2	MOMENT	۲
(DEC.)	C0E1		COE	•	COEF	•	CO EF	•	COF	•	COF	<u>π</u>
7	-21.9		70.7		21.7		1.5		-20.0		-12.5	
-35.	-19.6		65.7		24.8		2.1		-25.3		-13.6	
-30.	-15.7		61.6		~		6.0		-31.7		-14.9	
-25.	-15.9		58,3		~		-10.8		-28.1		-15.8	
-20.	-18.5		56.4		27.5		-14.3		-23.3		-20.1	
-16.	-18.0		55.0		27.3		-16.0		-17.8		-37.2	
-12.	-16.4	9.6-	54.0	•	28.0	27.0	-15.1	-13.3	-12.5	-11.6	0.04-	-35.5
.01	-12.4	-6.4	51.2	•		26.9	-11.2	-111.1	-5.7	-3.K	-30.0	-32.5
i	-0.5	-2.2	49.2	48.0	0	27.4	• •	-6.2	3.8	2.2	-37.0	-30.2
ė	8.4-	3.4	48.0	•	27.6	26.3	2.5	-1.4	S. 8	3.0	-36.4	-27.0
	9.0	9.6	47.8	•	1	24.8	7.7	2.3	S. 8	0.00	-33.4	-24.4
•	7.4	16.7	48.3	•	-	23.8	12.1	4.5	8.6	4.4	-30.9	-22.5
12.	14.5	24.0	4.64	•	4. 42	21.4	12.5	5.6	5.6	r.	-20°B	-21.9
16.		30.9		•		18.2		5.8		12.6		-21 • 1
20.		34.7		•		15.3		4.4		14.4		-17.9
25.		40.3		•		13.0		4.4		11.0		-17.6
30.		40.4		63.7		8.6		-0-1		4.0		-15.4
35.		42.3				10.4		9.0-		13.0		16.0
.40.		47.4		73.4		1.8		6.9-		10.6		0.41

TABLE II. - D5 BULLDOZER FORWARD CONFIGURATION (CONTINUED)

PITCH	LIFT		DRAG		SIDE	1	PITCHING	ING	YAWING	ڻ ع	PULLING	SN.
ANGLE	FORCE		FORC	Ш	FORCE	m	MOMENT	12	MOMENT	7	FNUMBLA	FZ
(DE6.)	COEF.		COEF	•	COEF.	•	COEF.		COEF.	•	COFF	ů.
-04-	6.4-		77.5		28.9		8.5		-62.2		14.2	
+35°	-3.8		75.4		27.5		4.0-		-60.4		18.7	
-30.	-2.3		74.6		28.3		9.9		-58.3		15.6	
-25.	-2,5		72.5		27.8		-10.5		-52.4		v	
-50.	-5.2		72.5		56.9		-17.5		-46.1		٠ د د	
-16.	-4.2		71.8		26.8		-19.7		-37.3		F. P.	
112.	-1.9	1.1	71.0	•	27.2	27.6	-21.5	-22.8	-30.0	-20.3	-11.6	-18.3
	-0.4	50	8.69	•	28.1	28.0	-24.4	-26.1	-23.9	-12.7	-13.6	-21.9
1	1.0	0.1	69.1	•	29.4	27.3	-26.7	-28.3	-16.5	-B-8	-17.1	-22.6
•	2.2	4.	68.5	•	28.9	26 • 8	-28.8	-32.4	-8.6	-5.5	-10.0	122.6
•	0	0.0	68.6	•	29.5	26 • 1	-29.5	-34.8	5.6	-3.2	-23.2	-22
8.	8.2 11	1.1	67.3	•	27.4	24.4	-34.0	-31.3	-2.6	2.1	-19.7	-20.4
12.	8.9 12	4.	67.3	•	26.4	23.0	-34.0	-26.7	2.2	5.4	126.0	-36.1
15.	13	6*1		•		21.5		-23.3		8.2		-41.0
20.	16	9.0		65.3		19.7		-18.6		12.1		-44.0
75.	19	2.		•		16.7		-14.3		12.7		-47.4
30.	21	5.		•		13.7		-14.0		13.2		0.74-
300	22	9.		•		10.0		-17.8		10.0		7.54-
404	22	E •		66.3		0,0		4 70		,		

TABLE 11.- DS BULLDOZER FORWARD CONFIGURATION (CONTINUED)

The state of the s

ANGLE FORCE SIDE PITCHING YANING ROLLING ANGLE FORCE FORCE MOMENT MOMENT MOMENT MOMENT ANGLE FORCE FORCE FORCE FORCE MOMENT MOMENT MOMENT -40. -3.7 71.2 FORCE FORCE FORCE MOMENT MOMENT MOMENT -40. -3.7 71.2 19.5 25.1 26.7 1.3 COFF.		YAW ANGLES	-	75. DEG.	•								
FORCE COEF. GOEF. MOMENT MOMENT MOMENT MOMENT COEF. -3.7 -3.7 -3.7 -2.1 -3.7 -2.1 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -3.7 -	PITCH	L 1F1	·	DRAC	ø	SIDE	148	PITCH	ING	YAWI	92	ROLL	S N I
COEF. COEF. <th< th=""><th>ANGLE</th><th>FORC</th><th>Ä</th><th>FORC</th><th>E</th><th>FORC</th><th>m m</th><th>MOM</th><th>-2</th><th>MOM</th><th>FZ</th><th>MOM</th><th>+ 2</th></th<>	ANGLE	FORC	Ä	FORC	E	FORC	m m	MOM	- 2	MOM	FZ	MOM	+ 2
-3.7 71.2 19.5 25.1 -64.2 11.3	(DEG.)	COEF	•	COEF	•	COEF	•	C0 E	•	COE	т	COE	•
-2.1 70.2 18.8 19.0 -64.8 1.8.8 19.0 -64.8 1.8.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8 1.8	•04	-3.7		71.2		19.5		25.1		-64.2		1.3	
-1.04 69.4 18.5 11.1 -63.8 2.2 -1.01 69.0 19.1 -2.2 -62.3 10.8 -0.0 69.5 19.0 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 -0.0 68.8 19.0 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 -0.0 68.8 65.8 19.0 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 -0.0 68.1 66.1 19.3 19.2 -16.3 -18.4 -56.8 -3.8 -0.0 67.4 65.2 19.8 19.1 -25.1 -24.4 -48.6 -38.5 -5.3 -0.0 6.7 65.9 64.4 19.6 19.7 -30.9 -28.2 -42.6 -31.4 -10.4 -0.0 6.7 65.5 64.3 17.4 18.4 -32.9 -29.4 -37.1 -25.7 -11.1 -0.0 63.3 17.4 18.5 -29.4 -37.1 -25.7 -11.1 -0.0 62.9 11.5 -33.3 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5 -33.5	-35.	-2.1		70.2		18.8		19.0		-64.8		α•1	
-1.1 69.0 19.1 4.3 -61.5 1.04 1.2	-30	-1.4		69.4		18.5		11.1		-63.8		2.2	
0.00 69.5 20.7 -2.2 -62.3 0.88 1.2 68.8 19.9 -7.4 -60.0 2.9 -0.4 -0.6 68.6 65.8 19.0 19.0 -11.4 -14.4 -58.9 -49.5 -2.9 2.1 -0.5 68.1 19.0 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 3.4 -0.5 68.1 66.1 19.7 19.4 -21.0 -21.5 -58.2 -40.7 0.5 3.4 4.0 65.2 19.1 19.2 -16.3 -18.4 -56.2 -40.7 0.5 3.4 4.0 65.2 19.1 19.3 .25.1 -24.4 -48.6 -33.4 -5.3 4.0 6.7 65.5 19.1 19.3 .28.1 -25.6 -45.3 -33.4 -6.3 4.0 6.7 65.5 64.3 17.4 -25.0 -28.2 -45.6 -31.0 8.2	-25.	-1.1		69.0		19.1		4.3		-61.5		1.4	
19.2 -7.4 -60.0 2.9 -0.4 -0.8 68.6 65.8 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 2.1 -0.5 68.1 66.1 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 3.4 0.5 66.1 19.2 -16.3 -18.4 -56.2 -46.8 -1.8 3.4 0.5 67.4 65.2 19.4 -21.0 -21.5 -53.5 -40.7 0.5 3.4 4.0 66.9 64.5 19.1 -25.1 -24.4 -48.6 -33.4 -10.8 3.4 4.0 66.9 64.5 19.1 19.3 -28.1 -45.3 -33.4 -10.4 4.6 6.0 64.4 19.6 19.7 -30.9 -28.2 -42.6 -42.6 -31.4 -10.4 4.6 6.0 7 65.5 64.3 17.4 18.4 -29.9 -42.6 -42.6 -31.4 -10.4 4.6 6.0 7 65.5 64.3 17.4	-20.	0.0		69.5		20.7		-2.2		-62.3		0.8	
20.4 -0.6 68.6 65.8 19.0 -11.4 -14.4 -58.9 -49.5 -3.4 20.5 -0.5 68.1 66.1 19.2 -16.3 -18.4 -56.2 -46.8 -1.8 30.4 0.5 67.9 65.4 19.7 19.4 -21.0 -21.5 -46.8 -10.7 30.4 66.9 64.5 19.1 19.3 -28.1 -24.4 -46.6 -33.4 -10.4 30.4 4.0 66.9 64.5 19.1 19.3 -28.1 -24.4 -46.6 -33.4 -10.4 4.0 66.9 64.4 19.1 19.3 -28.1 -24.4 -46.6 -33.4 -10.4 4.0 65.9 64.4 19.1 19.2 -30.9 -28.2 -42.6 -31.4 -10.4 6.0 6.7 65.5 64.3 17.4 18.4 -32.9 -29.4 -37.1 -23.0 11.5 63.3 17.4	-16.	1.2		68.8		•		4.7-		-60.0		2.9	
2.1 -0.5 68.1 66.1 19.3 19.2 -16.3 -18.4 -56.2 -46.8 -1.8 3.4 0.5 67.9 65.4 19.7 19.4 -21.0 -21.5 -53.5 -40.7 0.5 3.4 2.6 67.9 65.2 19.8 19.1 -25.1 -24.4 -48.6 -38.5 -5.3 3.4 4.6 65.9 64.5 19.1 19.3 -25.1 -24.4 -48.6 -33.4 -6.3 4.6 65.9 64.4 19.6 19.7 -30.9 -28.2 -42.6 -31.4 -10.4 6.0 6.7 65.5 64.3 17.4 -32.9 -29.4 -37.1 -25.7 -11.1 8.2 63.3 17.4 -32.9 -29.4 -37.1 -25.7 -11.1 11.6 63.2 15.1 15.5 -29.4 -37.1 -25.7 -11.1 11.6 63.2 15.1 -29.4 -37.1 -25.7 -11.1 11.8 62.9 11.2 -33.3	-12.	1.0-	8.0-	68.6	•	19.0	19.0	-11.4	-14.4	-58.9	-49.5	-3.4	-11.6
3.4 0.5 67.9 65.4 19.7 19.4 -21.0 -21.5 -53.5 -40.7 0.5 3.4 2.6 67.4 65.2 19.8 19.1 -25.1 -24.4 -48.6 -38.5 -5.3 3.4 4.4 66.9 64.5 19.1 19.3 ::28.1 -25.6 -45.3 -33.4 -8.3 3.4 4.6 66.9 64.5 19.1 19.2 -25.6 -45.3 -33.4 -8.3 3.4 4.8 55.2 65.9 64.4 19.6 19.7 -30.9 -28.2 -42.6 -31.4 -10.4 6.0 6.7 65.5 64.3 17.4 18.4 -32.9 -29.4 -37.1 -25.7 -11.1 11.5 63.2 17.4 -29.7 -29.7 -23.0 11.8 63.2 15.5 -16.3 11.8 63.2 15.1 -33.3 -16.3 11.8 62.9 11.2 -36.4 -9.8 13.5 62.9 10.0 -37.2 -5.8	•	2.1	-0.5	68.1	66.1	19.3	19.2	-16.3	-18.4	-56.2	-46.8	11.8	-11.3
3.4 2.8 67.4 65.2 19.8 19.1 -25.1 -24.4 -48.6 -38.5 -5.3 3.4 4.4 66.9 64.5 19.1 19.3 ::28.1 -25.6 -45.3 -33.4 -8.3 3.4 4.4 66.9 64.5 19.1 19.3 ::28.1 -25.6 -45.3 -33.4 -8.3 4.8 5.2 65.9 64.4 19.6 19.7 -30.9 -28.2 -42.6 -31.4 -10.4 6.0 6.7 65.5 64.3 17.4 -32.9 -29.4 -37.1 -25.7 -11.1 11.5 63.3 17.4 -29.7 -29.7 -20.1 11.6 63.2 15.1 -25.5 -16.3 11.8 63.2 15.1 -25.5 -16.3 11.8 63.2 13.8 -34.4 -13.5 13.5 62.9 10.0 -37.2 -5.8	i	4.6		67.9	•	19.7	19.4	-21.0	-21.5	-53.5	-40.7	0 ₽•0	-16.6
3.4 4.4 66.9 64.5 19.1 19.3 28.1 -25.6 -45.3 -33.4 -R.3 4.8 5.2 65.9 64.4 19.6 19.7 **30.9 -28.2 -42.6 -31.4 -10.4 6.0 6.0 7 65.5 64.4 19.6 19.7 **30.9 -28.2 -42.6 -31.4 -10.4 8.2 63.3 17.4 **32.9 -29.4 **37.1 -25.7 -11.1 11.6 63.2 63.8 15.5 -31.5 -20.1 -15.3 11.6 63.2 15.1 -33.3 -15.3 -15.3 11.8 63.3 13.8 -34.4 -13.5 13.5 -36.4 -37.2 -5.8	•	4.6		67.4	•	19.8	19.1	-25.1	-24.4	-48.6	-38.5	5.3	-16.5
4.6 5.2 65.9 64.4 19.6 19.7 ~30.9 -28.2 -42.6 -31.4 -10.4 6.0 6.7 65.5 64.3 17.4 18.4 -32.9 -29.4 -37.1 -25.7 -11.1 8.2 63.3 17.4 -29.7 -29.7 -23.0 -23.0 11.6 63.2 15.5 -31.5 -20.1 -20.1 11.6 63.3 15.1 -33.3 -16.3 -16.3 11.6 63.2 13.8 -34.4 -13.5 -9.8 13.5 62.9 10.0 -37.2 -5.8	•	3.4	•	6.99	•	19.1	19.3	28.1	-25.6	-45.3	-33.4	-8-3	-20.3
6.0 6.7 65.5 64.3 17.4 18.4 -32.9 -29.4 -37.1 -25.7 -11.1 8.2 63.3 17.4 -29.7 -23.0 11.5 63.2 15.5 -31.5 -20.1 11.8 63.2 15.1 -33.3 -16.3 11.8 63.3 13.8 -34.4 -13.5 13.5 62.9 11.2 -36.4 -9.8 13.5 62.9 10.0 -37.2 -5.8	•	4.8	5.2	62.9	•	19.6	19.7	-30.9	-28.2	-42.6	-31.4	-10.4	€.E.Z.
8.2 63.3 17.4 -29.7 -23.0 11.5 63.8 15.5 -31.5 -20.1 11.1 63.2 15.1 -33.3 -16.3 11.8 63.3 13.8 -34.4 -13.5 13.5 62.9 11.2 -36.4 -9.8 13.9 62.9 10.0 -37.2 -5.8	. 12.	0.0	6.7	65.5	•	17.4	18.4	32.	-29.4	-37.1	-25.7	-11.1	-21.5
11.5 63.8 15.5 -31.5 -20.1 11.1 63.2 15.1 -33.3 -16.3 11.6 53.3 13.8 -34.4 -13.5 13.5 62.9 11.2 -36.4 -9.8 13.9 62.9 10.0 -37.2 -5.8	16.		•		•		17.4		-29.7		-23.0		-26.1
11.0 63.2 15.1 -33.3 -16.3 11.0 63.3 13.8 -34.4 -13.5 13.5 62.9 11.2 -36.4 -9.8 13.9 62.9 10.0 -37.2 -5.8	20.		11.5		•		15.5		-31.5		-20.1		-22.1
11.6 63.3 13.8 -34.4 -13.5 13.5 62.9 11.2 -36.4 -9.8 13.9 62.9 10.0 -37.2 -5.8	25.		11.1		•		15.1		-33.3		-16.3		-26.9
13.5 62.9 11.2 -36.4 -9.8 13.9 62.9 10.0 -37.2 -5.8	30.		11.8		•		13.8		-34.4		-13.5		-29.1
13.9 62.9 10.0 -37.2 -5.8	35.		13.5		•		11.2		-36.4		•		-29.9
	• • •		13.9		•				-37.2		-5.8		4.4

TABLE II. - DS BULLDOZER FORWARD CONFIGURATION (CONTINUED)

	YAW ANGLE=		90. DEG.	•								
PITCH	LIFT		DRAG	وي	SIDE		PITCHING	ING	YAWING	9 2	ROLL ING	5 N I
ANGLE	FORCE	ш	FORC	JE.	FORCE		MOMENT	- 2	MOMENT	Ľ	MOMENT	- 2
(DEG.)	COEF	•	COEF.	•	COEF.	•	COEF.	ė. LL	CDEF.	·	COEF	•
-40.	2.0		62.2		8.6		32.9		-74.1		-16.7	
-35.	1.7				9.1		25.4		-75.7		-18.9	
-30.	2.9		61.4		4.6		19.3		-78.4		-15.3	
-25.	6.8		62.3		7 •3		7.2		-81.8		-10.6	
-20•	6.3		61.4		7.5		7.4		-81.7		-10.2	
-16.	6.7		61.5		8 • 2		1.4		-81.8		9.6-	
-12.	6.7	0.9	61.5	Ġ	0.8	7.9	6.5	-7.3	-79.1	-80.5	-13.1	-21.5
• 6 -	4.0	6.5	62.7		7.2	9. ′	-10.6	-12.4	-80.2	-79.0	-12.5	-21.5
Ť	8.0		62.2	œ.	9•9	6.8	-14.9	-17.8	-78.6	-79.3	-7.5	-21.4
•	8•3	7.6	62.1	Ġ	6.1	6.2	-21.0	-23.0	-77.2	-77.8	-11.2	-21.2
•	11.1	8.2	61.3	Ġ	5.7	5.1	-25.2	-28.5	-76.6	-77.0	18.5	-50.5
•	0.6	9.3	61.7	6	5.4	5.6	-30.9	-33.3	-71.2	-73.0	-11.4	-19.3
12.	9.7	7.7	62.6	6.69	0.4	4	-36 • 1	-38.8	-71.2	-71.0	-7.3	-23.1
15.	•	8.4		ò		4.2		-43.1		-66.8		-22.4
20.	ι	8.8		o.		ω. 8		-46.5		-63.1		-21.2
25.		9.2	•	ċ		3.6		-53.0		-50.7		-23.6
30.		9.3		61.2		2.5		-58.3		-55.1		-22.6
35.		0.6		ċ		1.7		-62.0		-49.7		21.4
+0+		9.5		61.1		1.0		-66.7		-45.0		-10°

TABLE 11.- DS BULLDOZER FORWARD CONFIGURATION (CONCLUDED)

	YAW ANGLE=		95. DEG.	•								
PITCH	LIFT	A	DRA	<u>ن</u>	SIDE		PITCHING	I NG	PANING	ڻ ع	ROLLING	52
ANG. E	FORCE	'n	FORCE	n c	FORCE	Ē	MOMENT	FZ	MOM	Z	FNUMENCE	
(DEG.)	COEF	.•	COE	•	COEF.	•	COEF.	• 1L	COEF.	• ! L L.	COEF	•
•04-	5.4		58.9		8.0		37.5		-83.0		-16.7	
-35	7.2		58,3		8.8		31.6		-86.2		-14.7	
-30.	10.4		58.3		8.6		26.1		-87.8		-K.7	
-25.	10.5		58.4		7.6		20.5		-91.5		-3.4	
-20.	13.1		59.1		6 •3		15.5		-96.5		0.7	
-16.	13.7		59.4		5.2		8.0		4-96-			
-12.	13.3	13.5	59.7		4.7	4.1	2.4	-2.7	8.66-	-97.9	2.1	-6-1
-8-	12.7	13.9	61.5	57.8	1.6	3.3	-3.3	6.2-	-95.7	-99.5	3.0	-4°F
i	13.0	14.6	63.4		-1.4	1.8	7.7-	-13.6	-86.4	-100.5	4	-1.7
ċ	10.8	14.3	64.4	8	-3.5	1.2	-13.9	-19.8	-83.6	-97.A	3.7	0.7
.	10.9	14.3	64.0	8	- •	-0.5	-18.8	-26.4	-82.7	-94,7	3.6	٥.
•	10.9	13.7	65.4	57.8	3° 9	-1.1	-23.3	-31.3	-77.9	-93.0	n o	2.0
12.	•	13.8	66.3	6	4.9	-1.4	-29.6	-38.7	-78.7	-80.0	4.7	1.7
16.		13.2		D.		-2.6		-45.2		-89.0		ຸກ
20.		13.4		30		-3.4		-50.1		-84.0		3.6
25.		13.4		Ġ		7.9		-57.3		-81.6		0
30.		12.7		59.3		2.9		-62.5		-73.6		m vc
35.		12.5		ď		0.9		-69.5		-68.0		10.7
•0•		11.3		61.1		-8.0		-74.7		-61.0		7.0

TABLE III.- DS BULLDOZER / BLADE CONFIGURATION

,	YAW ANGLE = -90.	06- =	• DE G.									
110m	1161		DRAG		SIDE		PITCHING	NG I	YAWING	91	ROLL ING	S N
AMGLE	FORCE		FORCE	IJ	FORCE	ш	MOMENT	+ 7	MOMENT	<u> </u>	MOMENT	۰
(DEG.)	COEF.		COEF.	•	COEF	•	COEF	•	COEF.	•	COEF.	•
9	0.4		70.5		-12.0		-23.8		13.2		54.9	
- N	0 6		70.3		-12.3		-25.8		9.6		29.6	
-30-	5.2		70.2		-11.2		-25.8		6.3		25.0	
-28.	6.1		69.6		-10.7		-26.0		4.2		25.1	
-20.	4.1		70.2		-10.0		-27.1		1.4		28.9	
-16-	7.6		70.2		9.6-		-27.4		-1.4		20.5	
-10	9 9 9	9-5	70.4	9.69	-8-5	-8.5	26.4	-29.8	-2.1	0.5	25.9	35
		8.7	69.7	69.3	-	-7.3	-26.5	-28.5	-5.4	0.1	23.9	31
		2.2	70.0	689	6.7-	6.7-	-25.7	-28.9	-5.9	-5.1	20.7	28.
•		0.0	70.6	70.07	-7.5	-7.2	-25.4	-28.9	-8.8	-6.2	50.9	31.
		***	69.5	70.1	6.5	-5.3	-24.0	-27.4	6.6-	ار 8 • کا	21.9	29.
		7.4	70.0	70.3	9	4.9	-22.7	-26.4	-11.2	-10.7	20.3	32.
120	10.7	11.0	70.8	70.0		5.5	-22.7	-25.0	-14.1	-12.6	19.2	27.
16.		5.0	ı	69.5		-3.3		-24.3		-13.8		26.
20.		3.2		70.6		-3.3		-23.5		-17.8		30.
28.		~		70.8		-2.1		-21.0		-18.0		26.
e e	12	20.0		70.8		-1.3		-20.5		-21.6		28.
35.	. .	1.7		70.7		0.2		-17.6		-22.A		0 0
• 0 •	7	12.5		71.4		2.6		-15.1		-23.2		25.

TABLE 111.- D5 BULLDUZER / BLADE CONFIGURATION (CONTINUED)

	NA WAY	YAW ANGLE= -60.	0. DEG.	•								
PITCH	LIFT		DRA	و	S IDE	W.	PITCHING	fI NG	CNIMEX	<u>ن</u> 2	- 100	2
ANG. E	FORCE	'n	FORCE	CE	FORCE	CE	MOMENT	Z) F	MOMENT	2 -
(DEG.)	COEF	•	COE	•	COEF.	•	COEF.	•	COEF	•	COEF	•
•	0.3		98.5		9		-101-4		24.1		4.48	,
-38.	-0.5		95.6		-7.6		-104.6		17.8		F 4 8 8 -	
-30.	-3.0		93,3		4.9		-106.1		11.1		-84.4	
-25.	8.9-		8.06		7-7-		-104.6		0.2		-72-0	
-20•	-9.1		89.9		-9.1		-104.6		-6.7		-71.2	
-16.	-8-5		88.3		9.6-		-102.1		-11.9		-67-1	
-12.	-10:-	-8.0	86.1	•	-10.8	-14.4	7.76-	-91.7	-20.0	-29.0	160.68	-49.6
.8.	-10.5	-6.0	85.1	83.6	-11.5	-14.8	-88.8	-85.2	-29.3	-38.9	150.1	-41.7
•	-7.5	-3.4	83.2	81.9	-13.5	-15.6	-80 •6	-78.5	-37.4	-46.6	142.6	-36-1
•	-5.7	-2.2	81.5	•	-14.0	-16.1	-75.3	-70.5	-45.0	-52-1	E. 46.	0.80
÷,	-3.B	1.9	80.3	79.3	-14.5	-16.3	-66.8	-63.9	-50.9	155.8	-20.9	-23.5
•	-0.2	9.	78.5	•	-14.7	-16.2	58.5	-57.0	-55.3	150.5	-10-3	-15.1
12.	2.0	5.3	77.7	77.5	-14.0	-16.0	-52.8	-48.4	-58.3	-63.4	-13.6	A . 7 .
16.		•••		•		-14.2		-38.5		-63.4))	4.7
20.		m • m		•		-12.0		-26.7		-66.0		11.67
25.		9.6		•		-11.0		-17.7		160.2		10.6
30.		10.7		•		-9.5		-11.0		-70.5		9
35.		12.6		79.3		7.7-		-5.5 5		8,891		
0		15.7		•		F. 4		5.6		-65-3		17.5

TABLE III. - D5 BULL DUZER / BLADE CONFIGURATION (CONTINUED)

	YAW ANGLEE -30.	= -30. DEG.	•							
DITCH	LIFT	DRA	و	SIDE		PITCHING	YAWING	ڻ ع	RULL ING	ING
A MOS E	FORCE	FORCE	1	FORCE	w	MOMENT	MOMENT	۲	MOMFINE	⊢ 7
(066.)	COEF.	COEF.	•	CUEF.	•	COEF.	COFF.	•	COFF.	•
4	1.00-	111.7		5.0		-147.9	57.3		0.19-	
-888	-7-	107.1		1.0		-146.3	57.2		-65.0	
-30	-9.0	101.6		9.0		-136.9	9.09		-61.2	
-25	-12.7	95.6		-2.0		-141.4	62.7		-64.0	
+204	-18.8	92.2		-2.0		-143.9	62.5		-59.0	
-16.	-23.5	87.5		-2.6		-148.1	62.0		-53.3	
-12.	-25.7 -22.	.2 84.1	82.1	-3.1	9	-156.6 -159.8	63.1	51.2	-52.1	-47.5
4	26.4		_	7. 9	-7.6	-154.8 -155.8	51.0	41.6	-43.2	-38°5
7	m	ĸ.	77.77	6.5	-9.5	-156.5 -158.3	43.6	35.0	-33.3	-33.2
	-26-1 -17.	m	78.8	-7.3	-10.0	-143.2 -148.0	35.9	25.5	-24.2	-30.0
3	20.0			-8.5	-11.5	-129.3 -136.2	25.8	13.9	-42.9	-27.1
		~	68.2	-11.1	-12.3	-118.3 -122.4	7.6	-4.5	-24.3	-30.A
	0			-10.9	-13.6	-129.2 -134.1	-3.4	-12.9	-32.0	-38.7
16.	•	•			-10.5	-144.8		-25.5		-55.7
20.	12		75.6		-7.1	-131.0		-28.4		-56.5
88	200	5	9.62		-2.7	-108.2		-31.0		-47.0
300	i N	1 0	84 .A		1.8	-87.1		–33.3		-38.0
35.	200	•	89.1		4.2	6.07-		-43.0		-37.2
•0•	23	. 7.	91.5		9.9	-46.0		-42.A		-27.7
-										

TABLE 111.- 05 BULLDOZER / BLADE CONFIGURATION (CONTINUED)

DE G.

•

YAW ANGLE=

ANGLE (DEG.)				SIDE		PITCHING		SNIME X	و	POLL ING	5
(DE6.)	FORCE	FORCE		FORCE		MOMENT		MOMENT	-	LNUMUM	⊢ 2
100	COEF.	COEF.		COEF.		COEF.		CDEF.	•	CHEF	•
	-6.7	7.56		0.5		-179.1		80		-3.6	
-36.	6.8-	88.6		0.7		-165.5		0.9		-3.0	
-30	-12,3	81.6		9.0		-164.9		4.7		-1.6	
-25.	-16.4	73.1		1.6		-155.4		2.6		c 8	
-20.	-18.3	65.8		1 • 1		-145.4		3.2		0.1	
-16.	-19.0	59.6		7.0		-141.4		0.0		-U-V	
-12.	-19.1 -15.1	53.2	49.2	4.1	1.7	-137.2 -130.2	0.2	9. E	2.7	-2.1	-1-3
•			43.8	4.1	2.5	-118.0 -115.	5.8	1.7	5.1	-0.2	ر د د د
Ť	-17.0 -13.6		38.1	1.5	1.9	-112.5 -122.1	2.1	3.2	4.0	0.2	2.0-
•			34.46	1.5	1.2	-133.6 -143.0	3.0	2.7	5.0	-0-1	-0-1
•			32.8		1.8		7.9	1.8	3.5	0.0-	ر د د
•			•	2.3	2.1	-156.0 -167.2	7.2	1.5	1.5	0.4	0.0
12.			39.7		2.4	-152.0 -159.6	9.6	٥. ه	9.0	J. I	2.1
16.			7.94		1.5	-148	8.5		2.0		w.
20.	2.1		53.5		1.8	-145.5	5.5		٠. س		1.7
25.	8.1			-	8.0	-98-	6.8		5.5		c
30.	14.1	~	66.2		1.9	Ý	-66.1		2.6		-0-1
35.	18.5		•		1.9	14-	-40.3		1.7		0.
•04	22.2	-	96.6	•	9.0	Š	-25.8		2.3		0.4

トラーはでは、中では100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、100mmのでは、

TABLE III. - D5 BULL DOZER / BLADE CONFIGURATION (CONTINUED)

	YAW ANGLE=	8. DEG.								
PITCH	LIFT	DRAG		SIDE		PITCHING	CNIMAY	2		2
ANGLE	FORCE	FURCE	'n	FORCE		MOMENT) <u>-</u>	MOMENT) <u>+</u>
(DEG.)	COEF.	COEF	•	CUEF.		COEF.	COEF	. •	CORF	. •
-40	-5.2	100.6		-0.7	•	-176.7	6		0.8	
-35.	0.6-	4.7		-1.1	•	-157.9	-8.7		15.8	
-30.	-11,5	38.7		-0-3	•	-150.5	-14.1		19.9	
-25.	-14.2	81.0		0.2	•	-146.2	-20.4		21.5	
-20.	-15.7	72.7		1.9	•	-135.6	-26.3		700	
-16.	-21.2	62.9		4.1	•	-134.6	-23.0		16.4	
-12.	-22.7 -17.8	59.9	54.3	5.1 3		-123.3 -123.2	-24.2	-24.5		6
•	-22.2 -17.0	53.4	•			-	-35.7	-34.0	יי	7.1
i	-21.7 -15.0	48.6	•				-35.0	-33.R	η. • •	. 6
•			•			-129.1 -139.8	-37.3	-33.7	α.	7.6
•	_		•				-41.5	-42.3	0	14.7
ě	-11.3 -4.1	0.04	•			39.0	-45.5	M • M • I	14.0	16.5
12.		42.	•	6 4.6	-	-142.7 -158.2	-35.7	-31.1	11.4	- L
16.	8.5		52.9	01	10.8	-151.1		-16.4	•	וא פו
20.	9*0		•	12	2	-137.8		2.8		13.0
25.	10.8		•	•	-	-89.7		12,3		
30.	16.4		•	5	4.	-60.5		2.5		
35.	20.0		•		٥.	-44.8		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		4
•0•	22.5		87.0	£-	-3.1	-34.8		V • Y		1101

TABLE 111.- DS BULLDUZER / BLADE CONFIGURATION (CONTINUED)

	YAW ANGLE=		16. DEG.	•							
PITCH	LIFT		DRAG	19	SIDE		PITCHING	SNIME	o Z	POLLING	<u>ن</u> 2
ANGLE	FORCE		FORCE	ננ	FORCE	F	MOMENT	MOMENT	1 2 3 3 3 3 3 3 3 3 3 3	LNEWCM	⊢ 7
(DEC.)	COEF		COEF	•	COEF.	•	CO EF •	COEF.	ı.	COEF	•
•04	-7.2		106.4		-3.5		-175.0	-28.4		47.0	
-35.	-7.9		101.1		1.5		-158.9	-30.2		42.3	
-30.	0.6-		94.5		3.5		-150.1	-39.1		41.0	
-25.	-14.4		88.4		3.9		-145.6	-44.7		30.8	
-20.	6.91-		80.2		7.0		-140.4	-44.6		37.3	
-16.	-22.1		74.4		7.3		.131.1	-36.2		20.4	
-12.		20.8	69.2	65.4	10.0	6.4	-124.8 -127.7	-39.K	-41.1	72.4	21.6
-8-	-23.6 -	-19.9	64.3	61.3	10.2	7.3	-127.9 -128.6	-46.2	-4K.0	18.2	17.0
• 4-	•	19.2	59.5	•	10.0	8.5	-125.0 -126.6	-41.7	-45.3	17.5	18.0
•	m	16.9	55.5	•	10.1	10.9	-116.5 -132.4	3.0c	-51.6	0 - 5 1	22.2
•	_	-7.9	52.3	52.5	10.5	11.2	-124.4 -138.9	-57.7	160.5	17.1	a • 5 c
«	4.6-	-1.6	52.6	•	11.0	11.9	-132.5 -148.0	-56.3	-54.1	17.8	r. V.
12.	-3.0	6.1	33.6	•	11.0	11.8	-135.9 -152.6	-44.	100.5	10.3	20.4
16.		11,5		•		12.1	-149.1		-14.7		0.70
20.		15.0		•		0.0	-149.6		3.7		A. A.C
25.		20.3		70.8		3.6	-112.5		15.0		ر. د از
30.	٠	23.5		77.5		9.0-	-80.5		15.7		12,9
35.	_	23.7		84.7		-1.5	-64.7		A. 05		14.1
0	-	22.7		7. 06		-3.1	0-25-0		27.6		29.1

TABLE III.- D5 BULL DOZER / BLADE CONFIGURATION (CUNTINUED)

	YAW ANGLE=		30. DEG.	•							
PITCH	LIFT		DRAG	19	SIDE		PITCHING	SAMAY	g	POLL ING	ტ 2
ANGLE	FORCE	Ņ	FORCE	'n.	FORCE	111	MOMENT	MOMENT	+	MOMENT	-
(DEG.)	COEF	•	COEF	•	COEF	•	COEF.	COEF	•	COEF.	•
•	-3.3		116.8		-0 •2		-152.9	-48.0		655 33	
-98-	-7.2		1111.3		1.5		-153.1	-47.5		62.8	
-30.	9.6-		103.8		2.4		-146.2	-51.0		62.7	
1200	-13.2		98.8		3.3		-141.1	-52.2		59.9	
-20.	-18.9	*	93.9		4.8		-144.7	6.64-		59.1	
-16.	-25.8		9006		5,5		-142.0	-48.2		50.4	
-12.	-25.0	-22.9	96.6	84.0	7.6	7.0	-157.5 -161.1		-42.1	50.9	40
	-27.9	-23.7	83.1	80.5	9.6	7.4	-166.6 -151.2		-34.0	47.1	40.
***************************************	-30.2	-24.3	79.6	77.0	4.0	5. 8	-156.5 -156.9		-29.3	35.0	66
•	-28.2	-18.9	76.0	74.5	9.6	10.9	-146.7 -149.4		-21.2	29.7	. 4E
	-22-2	-11.2	72.8	70.4	11.6	12.8	-136.8 -135.1		-10.7	26.0	100 100
	-11.8	-2.6	70.1	68.4	13.3	13.6	-119.3 -123.9		V . K	27.2	35.
***************************************	8.0.	2.3	69.1	70.4	14.4	15.4	-109.0 -136.0	16.2	18.1	20.R	44
16*		7.7		73.0		11.7	-142.6		30.5		47.
20.	e. ·	12.3		76.2		9.1	-135.B		α. • γε		53°
200	•	21.4		80.5		4.3	-113.0		37.8		44.
30.	•	24.4		85.9		8.0-	-93.6		40.4		47.
35.		24.2		90.2		-2.6	-76.4		4 R . 2		43.
+0+		24.0		93.4		-5.3	-53.0		48.1		7.5

TABLE III.- D5 BULLDGZER / BLADE CONFIGURATION (CONTINUED)

さい 一日の苦味の食品の大学の情報を発展を発展のいいないのです。我などのなったっちゃっているとうなどではなるない

	YAW ANGLE=		60. DEG.	•								
РІТСН	LIF	-	DRAC	(9	SIDE		PITCHING	ING	YAWING	ڻ ح	ROLLING	' ; Z
ANGLE	FORCE	CE	FORCE	W C	FORCE	щ	MOMENT	FZ	L N U W O W	F 7	∑	 -
(DEG.)	COE	•	COEF	•	COEF.	•	• 15:00	•	COEF	•	COF FI	· .•
-04-	3.0		102.0		3.6		-111.7		-21.1			
-35	1.3		100.8		4.1		-114.1		-17.8		92.9	
-30.	-2.1		6.76		6.1		-114.3		-13.0		91.8	
-25.	-4.3		94.8		5.6		-113.6		0.8		מ ה	
-50.	-7.2		92.7		0°8		-109.7		0.6		78.5	
-16.	4.61	v	90.5		7.6		-104.7		16.3		69.5	
-12.	-6.1	-8.4	9.68	•	10.5	13.0	-104.6	-95.9	21.4	36.1	71.4	υ 13.
-8-	7.6-	-7.6	87.6	•	12.5	13.6	-96.5	8.06-	35.0	46.1	61.4	49.1
i	4.61	6.4-	86.4	83.1	14.0	14.5	-89.3	-82.4	43.7	₹1.7	74.0	41.7
ċ	-7.1	-2.3	•	•	15.2	15.3	-79.4	-74.2	50.1	57.K	4 4 4	ι. ε.
	-5.0	9•0	81.8	•	15.5	φ. 4	-72.6	-69.5	54.8	60.00	30.7	31.1
œ	-2.1	9°8	81.2	•	16.0	15.9	63.9	-62.0	60.7	6. 6. A.	30.7	0 0
12.	2.0	0•9	80.4	•	15.9	14.7	-57.2	-48.8	63.0	66.0	25.2	α. /
16.		6.5		•		14.1		-39.3		6.83 8.33		-
20.		9.1		•		11.8		-28.7		40°0		-4.F
25.		10.7		•		11.1		-16.5		70.0		-7.7
30.		11.5		•		8.6		0.9-		711.7		4.7-
35.		15.2		•		0.9		-0.5		72.2		α • •
+0•		15.8		7.77		4.7		4.3		58.2		α α α α α ι

TABLE III.- D5 BULL DOZER / BLADE CONFIGURATION (CONCLUDED)

AMGLE LIFT DRAG SIDE PITCHING YAWING ROLLING AMGLE FORCE FORCE FORCE FORCE FORCE FORCE FORCE MOMENT MOMENT COFF. -40. 1.3 72.1 10.0 -29.4 -13.2 -17.7 COFF. -35. 0.8 71.9 9.4 -29.4 -13.2 -17.7 COFF. -35. 2.1 7.9 9.4 -30.0 -29.0 -17.7 -77.7 -20. 2.1 9.4 -31.0 -4.3 -17.3 -77.3 -20. 2.1 7.0 9.0 -31.2 -4.3 -17.3 -77.3 -20. 4.5 7.2 9.0 -31.0 -4.3 -17.3 -77.3 -16. 4.1 7.0 9.0 -31.0 -4.3 -17.4 -77.3 -18. 5.7 6.9 6.2 7.8 -30.6 -31.9 -77.3 -18.		YAW ANGLES	# 90°	• DEG.									
FORCE FORCE MOMENT MOME	PITCH	LIFT		DRAG		SIDE		PITCH	ING	Y AW I	<u>ن</u> ح	- כ	() Z
1.3 72.1 10.0 -29.4 -13.2 -17.7 1.3 72.1 10.0 -29.4 -13.2 -17.7 2.1 71.9 9.2 -28.8 -13.6 -13.6 -17.3 4.5 71.7 8.8 -31.0 -4.3 -17.3 4.5 71.7 9.8 -31.7 -1.0 -17.4 4.9 72.2 70.8 7.9 6.7 3.0 -13.8 3.3 1.7 -17.4 -27.5 5.5 5.8 72.5 69.9 6.7 6.8 -29.7 -32.4 6.8 6.6 -17.4 7.1 6.2 72.1 70.1 7.6 6.4 -29.5 -31.0 8.4 10.1 -12.0 -21.4 7.2 6.6 71.1 70.1 7.6 6.4 -29.5 -31.0 8.4 10.1 -12.0 -21.4 7.2 6.6 70.7 69.8 6.6 6.0 -27.3 -29.3 11.8 12.9 -17.0 -23.6 7.0 7.4 73.0 71.0 5.8 5.4 -25.9 16.1 18.2 -27.5 7.0 69.8 6.5 6.0 -27.3 -29.3 11.8 12.9 -17.0 -23.8 7.0 7.0 70.1 7.6 6.4 -29.5 -31.0 8.4 10.1 -12.0 -21.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	ANGLE	FORCE		FORC	ii ii	FORCE	14.1	MOM	-) -	1 20 7	, H
1.3 72.1 10.0 -29.4 -13.2 -17.7 2.1 71.6 9.4 -30.0 -9.0 -9.0 -9.0 -9.0 -9.0 -9.0 -9.0 -	(DEG.)	COEF.		COEF	•	COEF	•	COE	·	COEF	. • ' li	COF	
1.7 71.9 9.2 -28.8 -11.6 -20.1 2.1 71.6 9.4 -30.0 -9.0 -17.3 4.5 72.7 9.8 -31.7 -1.0 -17.3 4.1 71.9 9.0 -31.2 -4.3 -17.4 4.9 5.9 71.4 69.9 6.7 8.2 -31.4 -31.8 3.3 1.7 -17.4 5.5 5.8 72.5 69.9 6.7 8.2 -31.4 -31.8 3.3 1.7 -17.4 -27.4 5.7 4.9 7.9 6.8 -29.7 -32.4 6.8 6.7 6.8 -29.5 -31.0 8.1 -17.0 -27.1 7.1 6.2 7.0 6.4 -29.5 -31.0 8.4 -27.3 -17.0 -27.3 8.3 5.6 70.1 7.0 6.4 -29.5 -27.3 11.4 -17.0 -27.3 9.7 7.4 73.0 71.0 5.6 5.4 -25.3 11.8 12.0 -27.3 7.6	-40	1.3		•		10.0		-29.4		-13.2		-17.7	
71.6 9.4 -30.0 -9.0 -17.3	-35.	0.8				9.8		-28.8		-11.6		-20-1	
2-1 71.7 8.8 -31.0 -4.3 -17.4 4.5 72.7 9.8 -31.7 -1.0 -17.4 4.5 72.5 9.0 -31.2 2.2 -17.4 4.9 5.9 71.4 69.9 6.7 8.2 -31.8 3.3 1.7 -16.6 5.5 72.5 7.0 6.2 7.8 -30.6 -31.9 3.0 4.1 -16.6 -27. 7.2 72.1 70.6 7.7 6.4 -29.5 -31.0 8.4 10.1 -17.0 -27. 7.2 6.6 7.0 6.4 -29.5 -31.0 8.4 10.0 -77.0 -27.0 8.3 5.6 70.7 6.4 -29.5 -31.0 8.4 11.0 -27.0 9.7 7.4 73.0 71.0 5.8 5.4 -25.9 16.1 16.1 16.0 -17.0 -27. 9.7 7.0 8.2 70.7 4.6 -27.9 16.1 16.1 16.0 -17.0 -17.0 7.6 8.2 70.7 4.6 -25.9 22.8 22.8 22.2 7.8 70.4 2.4 -18.3 21.1	-30.	1.7		71.6		4.6		-30.0		0.6-		-18.0	
4.5 72.7 9.8 -31.7 -1.0 -17.4 4.1 71.9 9.0 -31.2 2.2 -17.4 5.9 71.4 69.9 6.7 8.2 -31.4 -31.9 3.3 1.7 -16.6 -27.2 5.5 72.5 69.9 6.7 8.2 7.8 -30.6 -31.9 3.0 4.1 -14.6 -27.2 7.1 6.2 7.2 7.6 6.8 -29.7 -32.4 6.8 6.8 -29.7 -32.4 6.8 6.8 -29.7 7.2 6.6 7.0 6.4 -29.5 -31.0 8.4 11.4 -17.0 -27.3 9.7 7.4 73.0 71.0 5.8 5.4 -25.4 -27.9 16.1 16.1 16.0 -17.0 -27.3 9.7 7.4 73.0 71.0 5.8 5.4 -25.9 16.1 16.1 16.1 16.0 -17.0 -73.0 8.2 7.0 7.0 5.8 5.4 -25.3 26.9 16.1 16.1 <	-25.	2.1		71.7		8.8		-31.0		-4-3		-17.3	
4.1 71.9 9.0 -31.2 2.2 -17.4 4.9 5.9 71.4 69.9 6.7 8.2 -31.4 -31.8 3.3 1.7 -16.6 -20.6 5.5 5.8 72.5 69.9 8.2 7.8 -30.6 -31.9 3.0 4.1 -14.6 -27.2 5.7 4.9 7.2 6.8 -29.7 -32.4 6.8 6.8 -27.2 -27.4 -27.4 -27.4 -27.4 -27.4 -27.4 -27.0 -27.1 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0 -27.0	-20.	4.5		72.7		9.6		-31.7		-1-0		7.7	
4.9 5.9 71.4 69.9 6.7 8.2 -31.4 -31.8 3.3 1.7 -16.6 -20.6 5.5 5.8 72.5 69.9 6.2 7.8 -30.6 -31.9 3.0 4.1 -16.6 -27.7 7.1 6.2 7.9 6.8 -29.7 -32.4 6.8 6.6 -29.7 -32.4 6.8 6.7 -29.5 7.2 6.6 7.0 6.4 -29.5 -31.0 8.4 10.1 -12.0 -21.0 8.3 5.6 70.7 6.4 -28.4 -30.2 10.4 11.4 -17.0 -23.0 9.7 7.4 73.0 71.0 5.8 5.4 -25.4 -27.9 16.1 16.1 16.0 -17.0 -21.0 9.7 7.4 7.0 4.6 -25.4 -27.9 16.1 16.0 -17.4 -77.0 6.8 6.9 5.4 -25.4 -27.9 16.1 16.1 16.1 16.1 16.1 16.1 16.1 16.1 16.1 16.1	-16.	4.1		71.9		0.6		-31.2		2.5		-17.4	
5.5 5.8 72.5 69.9 8.2 7.8 -30.6 -31.9 3.0 4.1 -14.6 -29.7 5.7 4.9 72.2 70.8 7.9 6.8 -29.7 -32.4 6.8 6.6 -29.7 -32.4 6.8 6.6 -29.5 -31.0 8.4 10.1 -12.0 -27.1 7.2 6.6 71.1 7.6 6.4 -29.5 -31.0 8.4 10.1 -12.0 -27.3 9.7 7.4 73.0 71.0 5.8 5.4 -25.3 11.8 12.9 -17.0 -27.3 9.7 7.8 7.0 4.5 -25.4 -25.9 16.1 16.1 16.0 -17.0 -27.3 9.7 7.0 4.5 5.4 -25.3 16.1 16.1 16.0 -17.0 -17.0 9.7 7.0 5.9 5.4 -25.3 16.1 16.1 16.1 16.1 16.1 16.1 16.1 17.0 -17.0 8.2 7.0 7.0 7.0 7.0 7.0	-12.		•	71.4	•	6.7	8.2	-31.4	-31.8	(n)	1.7	1.5.6	-202-
5.7 4.9 72.2 70.8 7.9 6.8 -29.7 -32.4 6.8 6.8 -15.9 -25.5 7.1 6.2 7.7 6.4 -29.5 -31.0 8.4 10.1 -12.0 -21.0 7.2 6.6 71.1 70.1 7.5 6.4 -28.4 -30.2 10.4 11.4 -17.0 -21.0 8.3 5.6 70.1 6.0 6.0 -27.3 -29.3 11.8 12.9 -17.0 -21.0 9.7 7.4 73.0 71.0 5.8 5.4 -25.4 -27.9 16.1 16.0 -17.0 -27.0 9.7 7.0 4.5 -25.4 -25.3 16.1 16.0 -17.0 -73.0 8.2 71.2 3.8 -25.3 27.5 -71.2 7.8 70.4 2.4 -25.4 -25.3 27.5 -17.0 8.2 70.4 2.4 -16.2 27.5 -17.0 -1	÷	ın		72.5	•	8.2	7.8	-30.6	-31.9	0.0	4 . 1	-14.6	-22-
7-1 6-2 72-1 70-5 7-7 6-4 -29-5 -31-0 8-4 10-1 -12-0 -21-7-2 6-6 71-1 70-1 7-6 6-4 -28-4 -30-2 10-4 11-4 -17-0 -23-7-2 6-6 71-1 70-1 7-6 6-6 6-0 -27-3 -29-3 11-8 12-9 -17-0 -21-7-9 -21-2 7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-1 16-0 -10-6 -21-7-9 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21-1 16-0 -10-6 -21	†	~		72.2	•	7.9	6.8	-29.7	-32.4	6.8	(C)	-1 F. 9	1050
7.2 6.6 71.1 70.1 7.6 6.4 -28.4 -30.2 10.4 11.4 -17.0 -23. 8.3 5.6 70.7 69.8 6.6 6.0 -27.3 -29.3 11.8 12.9 -17.0 -21. 9.7 7.4 73.0 71.0 5.8 5.4 -25.4 -27.9 16.1 16.0 -10.6 -21. 7.2 70.1 4.6 -25.3 26.9 -2.1 18.2 -23.8 -22.8 -22.8 -22.8 -22.8 -18. 7.6 69.7 2.9 -21.1 2.3.8 -21.1 23.8 -17.0 -17.0 -17.0 -17.0 -10.3 -115.2 -115.2	ċ	-	•	72.1		7.7	6.4	-29.5	-31.0	æ.	10.1	-12.0	121.6
6.3 5.6 70.7 69.8 6.6 6.0 -27.3 -29.3 11.8 12.9 -12.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9 -21.9	•	N		71.1		7.6	4.9	-28.4	-30.2	10.4	11.4	-17.0	- V -
9.7 7.4 73.0 71.0 5.8 5.4 -25.4 16.1 16.0 -10.6 -21.7 7.2 70.1 16.0 -10.6 -21.3 70.7 4.6 -25.3 20.1 -23.8 8.2 71.2 3.8 -22.8 22.8 22.8 70.4 2.4 -18.3 26.1 -17.8 8.2 71.0 11.3 -16.2 27.5 -15.3	•	E)		70.7		9.9	0.9	-27.3	-29.3	11.8	2.0	-12.0	-21.0
7.2 70.1 4.7 -26.9 18.2 -23. 6.8 70.7 4.6 -25.3 20.1 -21. 8.2 71.2 3.8 -22.8 22.2 -18. 7.6 69.7 2.9 -21.1 23.8 -17. 7.8 70.4 2.4 -18.3 26.1 -17.	12.	~	•	73.0	•	•	5.4	•	-27.9	16.1	16.0	-10.6	-21.7
6.8 70.7 4.6 -25.3 20.1 -21. 6.2 71.2 3.8 -22.8 22.2 -18. 7.6 69.7 2.9 -21.1 23.8 -17. 7.8 70.4 2.4 -18.3 26.1 -17.	16.	2			•		4.7		-26.9		18.2		123.1
8.2 71.2 3.8 -22.8 22.2 -18.3 7.6 69.7 2.9 -21.1 23.8 -17. 7.8 70.4 2.4 -18.3 26.1 -17. 8.2 71.0 1.3 -16.2 27.5 -15.	20.	•			۲.		4.6		-25.3		20.1		-21.0
7.6 69.7 2.9 -21.1 23.8 -17. 7.8 70.4 2.4 -18.3 26.1 -17. 8.2 71.0 1.3 -16.2 27.5 -15.	25.	Q	•		Ŋ		•		-22.8		200		α - 1
7.8 70.4 2.4 -18.3 26.1 -17. 8.2 71.0 1.3 -16.2 27.5 -15.	30.	7							-21.1		α. κ.		7 7 7
8.2 71.0 1.3 -16.2 27.5 -15	35.	7	•		•		2.4		-18,3		26.1		α
	•0•	80	•				1.3		-16.2		27.5		

TABLE IV. - D5 BULLDOZER REVERSE CONFIGURATION

	YAW ANGLE= -90.	.E= -90	. DEG.									
PITCH	LIFT		DRAG		SIDE		PITCHING	ING	YAWING	ن ع	ROLL ING	UNG
ANGLE	FORCE		FURC	E	FORCE	w	MOMENT	N	MOMENT	FZ	MOMENT	FZ
(DE6.)	COEF.		COEF.	•	COEF.	•	COEF.	•	COEF.	. ш	COFF	• LL
-40.	0.0		63.6		4.5-		-56.9		-35.3		-6.8	
-35.	6,2		64.0		-2.8		-52.7		-38.4		-14.9	
-30	7.8		64.2		-3.3		50.7		-44.8		-10.2	
-25.	4.8				-2 •B		-45.0		-49.1		0.4-	
-20.	8.7		64.0		-2.1		7.04-		-52.6		0.01	
-16.	8.3		64.0		7.0-		-36.8		-55.1		-11.5	
-12.	10.2	11.0	64.2	-	-1.4	-0-3	-31.6	-33.6	-58.3	7.73-	-6.1	-10.6
-8-	9-1	10.6		N	9.0	8.0	-28.7	-30.3	-59.7	-60.A	-12.1	-12.2
***	*	11.3	64.4	62.4	0.3	-0.2	-23.4	-24.9	-61.8	5.44.	0.8-	-10.6
ö		7.6	65.3	6	1.1	1.1	-19.9	-22.2	-61.9	-62.7	-8-1	-15.2
;	N	4.6	64.6	n	1.8	2.4	-15.2	-17.5	-63.9	-64.1	F. 8-	-13.4
•	6.8	6.6	65.7	N	1.9	1.8	-11.2	-11.3	7.59-	166.4	-11.6	α α Ι
12.	4	0.01		'n	2.9	0.4	9.9	-7.4	-64.1	6.44-	-13.2	0.0-
16.		0.6		m		4.7		-2.8		166.7		-11.5
20.		5.8		4		0• 4		1.3		-67.5		-16.2
25.		7.3		4		4.7		8 • 4		-6 B.O		-12.0
30.		6.4		ß		5.7		14.1		147.0		-12.2
900		6.9		4		8.0		20.2		165.7		r. • 0 -
0		0.9				7.0		24. 0.		-64.0		-13.2

TABLE IV. - D5 BULLDUZER REVERSE CONFIGURATION (CONTINUED)

	YAW AN	VAW ANGLE= -60.	0. DEG.	•								
PITCH	LIFT		DRAG	(J)	S IDE	ш	PITCHING	I NG	YAWING	o Z	ROLL ING	c Z
ANGLE	FORCE	E	FORC	Щ	FORCE	CE	MOMENT	+ 2	MOMENT	FZ	FAMOW	F
(DEG.)	COEF	•	COEF.	•	COEF.	•	COEF.	e IL	COEF.	•	COEF	•
•0	-7.1		74.7		-18.5		0.76-		-64.6		11.3	
-35.	-5.6		73.0		-19.8		-89.5		-74.4		11.7	
-30.	-5.1		71.6		-20.3		-81.2		-82.8		α; σ·	
-25.	-3.1		69.3		-20.9		-74.9		-89.8		6.1	
-20•	-1.9		57.4		-19.9		-65.7		-94.9		4 ሮ	
-16.	4.0		62.9		-19.5		-58.4		-100.1		6.1	
-12.	1.4	4.4	64.5	64.4	-18.7	-18.7	54.2	-56.1	-104.8	-108.1	5.0	3.7
-8-	1.3	5.4	64.2	63.2	-17.5	-18.2	51.1	-50.8	-109.4	-112.9	۳, •	4 የ
†	2.5	9.5		8	-16.8	-17.3	-48.0	-44.3	-115.1	-120.3	4. C	υ. «
ċ	4.7	11.2	63,8	61.7	-16.8	-17.6	-40.0	-37.7	-121.7	-127.9	2.0	11.0
*	9.5	16.2	m	-	-15.9	-16.9	-30.3	-25.4	-129.1	-133.5	ν. α	16.6
•	14.2	21.1	63.0	60.3	-15.3	-15.5	-16.6	-12.1	-133.9	-130.0	14	7.00
12.	17.9	22.7	ò	61.4	-13.5	-13.1	-2.B	-1.5	-136.1	-142.5	7.007	α •
16.		26.3		59.2		-11.0		12.1		-150.A		v
20.		28.8		•		-9.3		25.4		-151.7		0.40
25.		30.0		-		4. 7-		39.3		-151.5		20.1
30.		30.B		62.8		-5.0		52.3		-146.6		r • r r
38.		O		63.1		-3.4		51.2		-142.5		٠ ١٠,
0		29.3		64.7		0.0-		70.1		-135.R		ر م م

TABLE IV.- DS BULLDOZER REVERSE CONFIGURATION (CONTINUED)

DE G.

YAW ANGLER -30.

PITCH	LIFT	6	DRAC	(9	SIDE	ш	PITCHING	ING	YAWING	ڻ ع	ROLLING	<u>ي</u> 2
ANGLE	FORCE	'n	FORCE	E C	FURCE	CE	MOMENT	FZ.	MOMENT	۲-	HUMUM	F
(DEG.)	COEF	•	COEF.	•	CUEF.	•	COEF.	•	COEF.	• LL	COFF	•
-04-	-21.0		71.1		-24 •3		-116.5		-39.4		14.2	
-35.	-21.4		67.9		-23.9		-112.5		-46.5		11.0	
-30.	-21.3		63.4		-22.8		-110.3		-50.5		5.9	
-25.	-21.3				-22.9		-105.7		-53.7		4.2	
-20•	-20.6		55.6		-22.3		-102.6		-55.6		4 E	
-16.	-23.				-25 · J		-109.6		-59.5		7.6	
-12.	-20	-16.8		53.2	-21.7	-25.1	-100.0	0.76-	6.09-	-64.5	11.5	14.2
-8-	-14.9	-10.5	•	50.8	-22.3	-25.2	-80.7	-76.1	-62.7	-6A.9	16.1	10.3
•	-7.6	-3.5	49.0	49.6	-21.6	-24.4	54.0	-52.1	-64.0	a • a y -	21.0	W. W.C
•	-2.2	1.7		40.4	-20.5	-22.6	-32.5	-31.2	-65.9	0-29-	23.4	24.R
*	3.2	_	48.1	49.6	-18.3	-20.5	-12.7	80.30	-61.1	-FR.0	23,1	7.4°
•	8.2	13.6	•	9.64	-16.8	-17.6	11.4	18.2	-61.7	-64.3	25.0	28.1
12.	16.4		49.7	51.7	-13.7	-15.0	45.4	49.3	6.09-	-64.3	30.4	34.3
16.		_		54 • 1		-12.5		8.64		-67.R		4:02
20.		31.2		55.6		-10.4		102.0		-67.1		45.0
25.		_		63.6		-5.5		103.8		165.6		7008
30.		38.6		65.8		-6.5		145.1		-64.7		₹. 14.
35.		41.8		9• 99		-5.2		159.5		-57.6		1.8.1
•0•		42.3		69,3		-1.9		157.2		148 • S		0.07

TABLE IV.- D5 BULLDOZER REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=	E= 0.	DE G.									
PITCH	LIFT		DRAG		SIDE		PITCHING	I NG	YAWING	ç	ROLLING	ن ع
ANGLE	FORCE		FORC	ш	FORCE	ш	MOMENT	FZ	MOMENT	⊢ 2	MOMENT	-
(DEG.)	COEF.		COEF	•	COEF.	•	COEF.	•	COEF.	•	COEF.	•
•	-15.5		44.0		6.0		-85.0		6.0-		-2.1	
-35.	-15.4		41.2		0.5		-78.9		-1.7		٦٠٠٥	
-30.	-13.9		37.6		₽.0		-66.8		-0-1		-2.2	
-25.	-11.4		33.8		0.0		-52.3		2.0		4-5-	
-20•	-8.7		30.0		9.0		-43.9		-1.3		6.0-	
-16.	4.9		27.2		1.2		-37.5		-5.0		-1.1	
-12.	-6.7	6.4	25.4	•	1.6	-2.3	-33.5	-26.4	-3.7	0.5-	0 • 0	2.0
-8-	•	5.	24.6	•	1.4	-2.7	-33.7	-30.4	-2.0	0.1	0.4	A
i	•		23.2	•	1.7	-2.0	-30.5	-27.3	0.5	0.8	-0 • h	1.5
•		9.	23.0	•	1.5	-2.4	-9.3	-1.0	-0-3	0 • 4	-0-3	•
		9.	23.0	•	1.2	-2.9	7.0	11.4	-0-4	9.0-	4.0-	u .
•	•	6.7	23.7	24.3	1.2	-2.5	17.5	25.6	-0.2	-3.9	0 • 0	U • U
12.		9.	25,1	•	1 • 3	-1.6	35.6	48.3	0.0	-1.0	-0-	c -
16.	-	7.7		•		-1.8		77.5		α• υ-		(/ •
20.	N	ò		•		-1.9		101.6		m.c.		J.C
25.	N	5.9		•		8.4		121.3		-12.2		-1.6
30.	~	2		38.2		-2.7		129.3		-4.5		١ - ١
35.	m	13.9		•		-0.5		156.5		4.0-		υ • • •
+0+	4	1.1		54 • 3		-0-1		184.4		0.7		- C -

TABLE IV. - D5 BULLDOZER REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=	4. DEG.									
PITCH	LIFT	DRA	9	SIDE		PITCHING	98	YAWING	ٯ	PULL ING	ن ا
ANGLE	FORCE	FORCE	CE	FORCE		MOMENT	+ 7	MOMEN	E	MUMERA	- 7
(DEG.)	COEF.	COEF.	•	COEF.		COEF.	•	COEF.	.•	COFF	•
-40	-12.4	•		3.1		-87.0		8.9		-8.2	
-35	-13.6	43.B		4.1		-80.1		8.6		-7.5	
-30.	-15.2	•		3.5		68.8		5.3		-7.3	
-25.	-13.0	37.0		3.4		-54.1		1.8		-N-V-	
-20.	-10.1	34.3		2.6		-43.8		-8.6		-4.3	
-16.	-8-1	31.6		3.3		-35.8		-8-1		-4.2	
-12.	-		25.4		2.8	-31.3	-29.7	6.9-	-5.4	-2.A	4.O-
•	-8.6 -5.4		24 - 1		3.3	6.15-	-34.5	-4.1	-5.2	0.2-	₹ • O −
1			•		3.5	-23.6	-26.0	-3.2	-1.4	-3.3	7.0-
•	-3.1 -0.3		•	5.0	3.2	-12.7	-8.2	-1.7	-0-3	-2.4	F. • 7-
•			•		3.5	3.2	5.0	3.5	1.7	-2.7	₽. 2.1
ċ			25.0		4.2	16.0	23.1	4.6	4.3	13.7	4.6-
12.	8.6 12.3		•	0.9	4 .5	39.7	51.0	3.3	n. m	14.6	7.4.4
16.	18.3	•	29.3		4.1		80.7		4.7		ע. ע 1
20.	21.8	gr.	•		4.2		101.0		3.1		ν. ν.
25.	26.5	·C	•		2.1		118.9		-4.3		-7.C
30.	28.3	•	•		3 • 3		129.9		0.2		d. 4-
35.		7	45.7	ī	-2.3		158.6		-1.1		¥ • ¥
40.	40.E	89	54 • 3	•	æ.		180.2		F. 9		σ• α Ι

TABLE IV.- DS BULLDOZER REVERSE CONFIGURATION (CONTINUED)

PORAGE FORCE MOMENT COEF. 49.2		YAW ANGLE=	H .	DE G.	_								
FORCE COEF. CO	PITCH	LIFT		DRAG		SIDE		PITCH	I NG	YAWING	ڻ ع	POLLING	UN I
-11.3 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0	ANGLE	FORCE		FORC	M	FURCE		MO WE	L Z	LUMMOM	- Z	ZHACM	⊢
-11.3 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0 -15.0	(DEG.)	COEF.		COEF	.•	COEF,	•	COE	• !L	COEF	•	COFF	· LL
-15.0 -15.8 -14.2 -15.8 -18.3 -18.3 -18.3 -18.3 -18.3 -18.3 -18.3 -18.3 -18.3 -18.3 -28.1 -28.1 -28.1 -28.1 -28.1 -28.1 -28.1 -28.2 -28.3 -28.4 -27.2 -28.3 -28.4 -27.2 -28.4 -27.2 -28.4 -27.2 -28.4 -27.2 -28.4 -27.2 -28.4 -27.2 -28.4 -27.2 -28.4 -27.2 -29.6 -29.6 -29.6 -29.6 -29.6 -29.6 -29.6 -29.6 -29.6 -29.8 -20.1 -27.3 -29.6 -34.2 -33.3 -19.1 -27.3 -29.6 -34.2 -33.3 -38.5 -36.1 -27.3 -29.6 -34.2 -33.3 -38.5 -36.1 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9 -37.9	-04	-11.3	-	•		8.9		-86.2	•	17.8		-14.3	
-15.6	-35.	-15.0	•			10.7		-83.7		18.1		-13.1	
-14.2 -12.8 -18.2 -18.8 -18.3 -18.3 -18.3 -18.3 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1 -18.1	-30.	-15.8	-	43.9		6.8		-75.5		15.2		-11.7	
-12.8 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5 -9.5	-25.	-14.2	-	40.5		7.6		63.8		10.0		8.01	
-9.5	-20.	-12.8		38,3		8.0		-51.5		-2.3		7-7-6	
-9.2 -7.3 32.1 28.8 7.6 6.0 -34.2 -33.3 -5.1 28.8 7.5 8.0 6.1 -27.3 -29.6 -34.2 -33.3 -29.5 27.5 8.0 6.1 -27.3 -29.6 -3.1 0.2 28.5 27.1 8.1 6.7 -19.3 -19.1 19.1 10.2 28.5 27.1 8.1 6.7 -19.3 -19.1 19.1 19.1 10.2 28.5 27.2 8.4 6.9 4.5 7.1 6.5 10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 17.9 32.5 8.1 6.4 6.9 6.0 123.0 27.4 38.5 6.0 3.6 123.0 37.3 48.9 -1.1 159.2	-16.	S)		35.2		7.2		-36.7		-3.5		α. «	
-8.1 -6.1 30.2 27.5 8.0 6.1 -27.3 -29.6 -5.7 2.3 29.5 27.1 8.1 6.7 -19.3 -19.1 -2.1 0.2 28.5 26.5 8.2 6.2 -7.6 -8.5 2.3 3.8 28.4 27.2 8.4 6.9 4.5 7.1 6.0 8.5 29.0 28.1 9.1 8.6 22.6 25.3 10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 17.9 32.5 8.1 6.4 91.8 27.4 38.5 6.0 123.0 31.8 48.9 -1.1 159.2	-12.	Q,	6	32.1		7.6	0.9	-34.2	-33.3	-2.6	16.4	α. α.	-3.7
-5.7 ·2.3 29.5 27.1 8.1 6.7 -19.3 -19.1 2.1 2.1 0.2 28.5 26.5 8.2 6.2 -7.6 -8.5 7.1 2.3 3.8 22.4 27.2 8.4 6.9 4.5 7.1 10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 17.9 32.5 8.1 6.4 6.9 4.5 50.1 21.8 27.4 38.5 6.0 123.0 31.8 48.9 -1.1 159.2 37.3 48.9 -1.1 159.2	-9-	-	~	30.2		8.0	6.1	-27.3	-29.6	-7.9	-10.7	0°C	12.6
-2.1 0.2 28.5 26.5 8.2 6.2 -7.6 -8.5 2.3 3.8 28.4 27.2 8.4 6.9 4.5 7.1 10.4 13.4 30.0 28.1 9.1 8.6 22.6 25.3 10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 21.4 34.8 34.8 6.4 91.8 27.4 38.5 6.0 123.0 31.8 43.2 3.6 142.9 41.0 56.1 159.2	i	~	6	29.5		8.1	6.7	-19.3	-19.1	7.6	-5.1	7.4-	-3.4
2.3 3.8 2.8.4 27.2 8.4 6.9 4.5 7.1 6.0 6.0 6.0 28.1 9.1 8.6 22.6 25.3 10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 17.9 32.5 8.1 69.2 27.4 34.8 6.4 91.8 27.4 38.5 6.0 123.0 31.8 48.9 -1.1 159.2 41.0 56.1 -1.1 159.2	•		2.	28.5		8.2	6.2	-7.6	8.5	-4.3	2.0	0.5-	13.2
6.0 8.5 29.0 28.1 9.1 8.6 22.6 25.3 10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 17.9 32.5 8.1 69.2 27.6 27.4 38.5 6.4 91.8 5.0 37.3 48.9 -1.1 159.2	•		Φ.	28,4		4.8	6.9	4.5	7.1	0.0	5.3	7.4-	14.6
10.4 13.4 30.0 29.8 9.2 9.0 44.7 50.1 17.9 32.5 8.1 69.2 21.4 34.8 6.4 91.8 27.4 38.5 6.0 123.0 31.8 43.2 5.6 142.9 41.0 56.1 159.2 41.0 56.1 159.2	¢		5	29.0		9.1	8.6	22.6	25.3	2.1	n. 1	ر. ا	Y .
27.4 38.5 6.4 27.4 38.5 6.0 31.8 43.2 5.6	12.		•	30.0			0.6	44.7	50.1	5.5	0	C• αΙ	σ Ι
27.4 38.5 6.0 31.8 43.2 3.6 37.3 48.9 -1.1	16.	17	0				8.1		69.5		σ. ι		-10.7
31.8 43.2 5.6 37.3 48.9 -1.1	20.	21	4.				4.9		91.6		4.4		-12.5
31.68 43.2 5.6 37.3 48.9 -1.1	25.	27	*				o• 9		123.0		η. ω.		0 4 1 1
41.0 48.9 -10.1	30.		•				3.6		142.9		0.0		-12.0
41.00 AF. 1	35.	37	۳.				-1.1		159.2		ر. د		-12.6
	•0	41	•		56.1		-8.1		179.1		18.4		-10.7

TABLE IV. - US BULLDOZER REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=	16.	DE G.								
10110	144	٥	8≱6	SIDE		PITCHING	S N	YAWING	ن	POLL ING	5 N J
ANGLE	FORCE	F	FORCE	FORCE		MOMENT	F.7	MOMENT	_	MOMENT	- ,
(DEG.)	COEF.	ช	COEF.	COEF.		COEF	•	COEF.	•	COFF	•
4	-15.6		0	18.1		-100.5		24.8		-10.1	
100	9			19.8		-93.8		30.4		-10.0	
	-15-1	51.	•	19.1		-80.2		27.7		-16.1	
-25	-14.6	48	0	16.8		-73.5		26.1		-13.R	
-20-	-14.1	***	E	15.3		61.2		20.1		ι. «	
-16.	-12.7		0	14.6		-49.2		15.5		٠ ٧	
-12	-15.0 -12.		9 35.9	14.5	13.1	59.5	-54.2	7.4	3.4	-11.	ر. د تا
40		37.	35	14.1	12.5	-46.8	-37.4	4 0	₽. ₽.	-14.0	-10.2
	1	9	35.	14.2	12.6	-34.0	-22.0	7.0	រ. ស	-13.3	-10 · n
ć	•	~	35	13.7	12.8	-11.9	-9-1	10.7	10.9	-13.0	-10.7
•	4.3 7.	7 37.	35,	13.4	13.3	3.4	7.2	11.6	16.1	-13-3	-12.5
.		4 38.	•	13.0	12.5	27.8	31.8	16.5	20.6	-14.R	-14.2
4	_	4 39.	7 38,	12.1	12.6	50.5	56.0	23.2	23.0	115.8	-16.5
16.	N	8	0.4		12.8		75.8		25°		-20.4
6	26,		•		13.7		102.8		37.3		-24.F
8	31,	0	•		11.6		129.8		38.8		-25.1
000	35.	~	52.0		4.6		150.9		36.4		126.0
10 EX	80	4	56.4		4.3		163.8		30.4		-27.a
*0	42,	•	60.4		-2.4		165.2		16.0		1.02-
,											

TABLE IV. - DS BULL DOZER REVERSE CONFIGURATION (CONTINUED)

いい いき 日本にはなるのでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日本のでは、日

	YAW ANGLE=	E= 30.	• DEG.	_								
PITCH	LIFT		DRAG	,,	SIDE		PITCHING	I NG	YAWING	ڻ ح	POLL ING	SN1
ANGLE	FORCE		FORCE	'n	FORCE	'n	MOMENT	FZ	MOMENT	トフ	FNEWDM	⊢ 2
(DEG.)	COEF.		COEF.	.•	COEF.	•	COEF.	•	COEF.	• U	COEF	• ti
•	-19.3		71.7		25.6		-116.3		39.5		0.81-	
- 10.50	-21.0		68.5		24.2		-112.8		44.0		-12.0	
-30	-20.5		0.49		24.3		-113.5		47.0		16 • 51	
-25.	-20.0		59.5		22.9		-107.3		51.0		4.4	
-20.	-20.6		56.9		23.4		-107.9		55.2		ן • ה•	
-16.	-21.2		55.0		22.8		-110.4		57.4		1 • ۵-	
-12.	n	24.5	53.7	•	23.4	21.3	-101.1	-76.1	29.6	58. W	-12.9	3°20'-
6	•	-6.8	51.4	•	23.4	23.3	-84.2	-70 -6	62.5	50.0	-15.R	-16.0
†		9.0-	50.0	48.6	23.0	22.7	60.1	-50.1	65.9	64.1	-10.8	-10°B
•	m	3.6	49.2	•	22.2	21.5	41.6	-31.2	65.4	4.59	-21.4	-20.7
•	4.0	9.1	49.8	•	50.9	19.8	-17.6	-7.2	66.0	66.2	-21.0	-22.1
•	11.2 1	15.3	49.9	•	18.8	17.1	12.3	21.6	63.9	65.1	-24.9	0.75-
12.	17.0 2	11.2	51.4	•	16.3	15.7	42.3	50.5	68.0	v	7.0E-	C • 081
16.	74	28.5				13.3		84.4		K7.1		-40.5
80.	m	32.5		56.1		12.1		106.2		67.5		-44-
25.	m	36.8		59.9		10.6		127.7		50 B		D. P. D.
30.	•	12.3		•		8.8		153.8		* 65.4		-54.0
35.	•	6.41		•		6.2		165.5		41.7		-F4.0
•0+	•	12.0		0.07		2.1		151.8		4.8		152.4

TABLE IV.- D5 BULLDOZER REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=	45. DEG.				
PITCH	LIFT	DRAG	SIDE	PITCHING	SNIMAY	SNI
ANGLE	FORCE	FORCE	FORCE	MOMENT	MOMENT	- NEWCE
(0£6.)	COEF.	COEF.	COEF.	COEF.	COEF.	CHEF
•	-14.2		24.3	-124.6	59°8	-14.0
-98.	-14.0		24.6	-119.1	68.7	ν·α-
-30.	-12.7	73.0	25,3	-113.3	80.5	7.
-25.	-12.8	•	25.5	-110.0	W. 78	ي و
-20.	-11.9	67.5	24.0	-103.9	9.06	5.47
-16.	-12.1	65.8	23.3	-100.2	96.1	ر د د
-12.	-8.7 -4.2	8		-92.7 -90.5	101.8 101.1	
÷	-4.3 1.1		23.6 23.2	-84.9 -81.5		0.2 -3.
i	-0.7 5.2	*		7.69- 6.91-	110.2 110.9	
•	10.	62.4 59.8				-7.0 -15.
*		-				
¢	. 19.	~	19.9 16.9		121.2 123.5	-24.2 -29.
12.	23.	61.8 60.3		4.8 15.7	_	
16.	27.0	61.0	11.4	37.3	110.6	
20.	30.6	8.09	0.0	60.1	115.0	(1)
25.	32.2	63.1	7.4	82.5	107.0	, y 's
30.	33.5	65.1	5.6	101.8	9.00	0.A.
35.	37.7	68.5	1.9	112.2	A . CO	α υ 1
0	34.7	70.1	1 . 1	121.9	86.6	ווייייייייייייייייייייייייייייייייייייי

TABLE : IV. - N5 BULLDOZER REVERSE CONFIGURATION (CONTINUED)

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	YAW ANGLES	.Ez 60.	• DEG.									
PITCH	LIFT		DRAG		S 10E		PITCHING	I NG	YAWING	ن ع	POLL ING	C N L
ANGLE	FORCE		FORCE	'n	FORCE	E E	MOMENT	+7	MOMENT	FZ	MOM	F 7
(DEC.)	COEF.		COEF	•	COEF.	•	COEF.	•	COEF.	•	COFF	•
• • • •	1-8-		75.7		20.5		0.76-		62.9		ς. α.	
-38.	-3.1		73.7		21.3		-90.5		77.7		-7.4	
-30.	€.0-		71.6		22.5		-83.0		85.8		0.4-	
-25.	0.0		70.5		21.8		-75.6		93.9		-3.5	
-20.	2.5		68.4		21.4		67.8		7.16		ν. C	
-16.	8.8		67.2		20.5		62.0		101.8		2.1	
-12.	4.5	6.8	65.4	61.4	19.2	16.7	-58.3	-58.5	108.5	100.1	4.	0.4
-8-	6.1	Ŋ	64.8	61.6	18.9	16.7	51.9	-56.2	1111.6	117.4	4 a	ν. ο
†	7.3	9	63.9	8.09	17.6	16.9	-48.1	-46.7	119.0	124.0	ψ. M	ر لا ا
ċ	•	0	64.3	61.2	17.2	16.3	-38.9	-39.5	128.0	133.0	-1.1	a • 4 1
•	ĸ,	•	64.4	60.3	15.8	15.3	-30.7	-27.1	131.7	137.6	A. 7-	-11.7
£	17.5	٥	64.3	61.0	14.9	15.0	-18.8	-15.5	138.4	143.7	-10.8	-15.5
12.	n	23.7	54.8	62.3	13.8	13.8	-5.3	-1.6	141.7	146.2	-17.1	6.46-
16.	••	6.52		60.7		12.1		12.8		140.5		0.00-
20.	14	28.0		62.4		10.8		24.8		150.0		-20.0
25.	14	28.5		63.0		10.5		36.4		146.8		-50.0
30.	14	28.3		9. 49		8.8		49.5		142.K		7.18-
33.	•	28.4		64.8		5 • 2		58.9		۲. • ۲۲		7.45-
40.	**			6. 59		1.9		6.07		127.6		1.05-

TABLE IV. - D5 BULLDOZER REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE		75. DEG.	•								
PITCH	LIFT		DRAS	_G	SIDE		PITCHING	ING	UZI34	ن ع	שטרד זאט	<u>د</u> م
ANGLE	FORCE	į11	FORC	T.E.	FORCE	E	MOMENT	-	MOMENT	- 2	FNUMUM	⊢ Z
(nFG.)	COEF.	•	COEF.	•	COEF.	•	COEF.	•	COEF	ب	COFF	• LL
-40•	•		67.3		19.0		-75.2		64.7		8 °C [
-35.	5.7		66.7		19.1		-68.6		71.9		-10.8	
-30.	6.5		65.0		18.1		61.7		7.97		-7-5	
-25.	7.6		64.2		17.9		-54.3		81.8		-7.3	
-20•	6.0		64.3		17.1		-49.2		88.6		C • K -	
	0.6		63.6		17.2		-42.5		α. 6 α		(· · · · · · · · · · · · · · · · · · ·	
-12.	10.3	13.4	62.8	9.65	16.3	14.0	-38.1	-38.7	95.2	0 H . 3	-R.7	۳. ا ک
.	11.6	15.0	62.7	4.09	15.5	13.2	-31.6	-31.8	100.0	104.5	C • Y	14.7
•	•	15.4	62.6	59.4	14.0	12.4	-24.9	-26.4	101.1	105.4	α• ζ-	L .
ċ	12.7	15.1	62.4	2.65	13.3	11.2	-19.0	-19.5	105.6	108.2	-1.0	(· · · · · · · · · · · · · · · · · · ·
*		12.9	61,3	Ġ.	12.1	10.7	-12.6	-13.5	105.0	110.0	c • c	1 α
ċ	•	11,0	0.09	7	10.5	6.3	-8.2	-7.2	103.8	100.0	r.	14-1
12.	•	14.7	60.4	7.	6.9	ဘ ဲ့ စာ	0.2	-0-1	165.7	112.4	C.	7.5
16.		14.8		8		٥.٢		6.6		1.5.6		0.41
•0 <i>ċ</i>		16.2		57.0		0.9		11.0		113.6		1.0-1
25.		15.6		œ		5.5		20.5		116.1		ι. ς. Ι
30.		15.0		•		3.0		0.42		112.8		0
35.		15.4		57.3		3.6		38.0		116.2		¢ •
•04		13.7		57.6		0.7		46.3		100.0		•

TABLE IV.- D5 BULL DOZER REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=		90. DEG.									
PITCH	LIFT		DRAC	(5	SIDE		PITCHING	I NG	YAWING	ပ္	POLL ING	ڻ ع
ANGL F	FORCE	***	FORCE	ш	FORCE	m	MOMENT	FZ	MOMENT	L 2	FZEWOW	F
(DEG.)	COEF		COEF	•	COEF.	•	COEF.	• IL	COEF.	•	CHEF	•
-40.	3.4		63.6		2.5		-55.4		35.8		26.3	
-35.	6.0		63.6		3.0		51.8		40.6		22.A	
-30	6.3		63,3		3.5		-47.6		43.0		22.3	
-25.	8.4		•		2.5		-42.9		49.6		ر. د. د.	
-20.	6.5		_		0.5		-38.8		52.4		21.0	
-16.	4.6				1.7		-34.7		54.4		1 5 B	
-12.	7.6	4.0	64.1	•	0.0	-1.1	-30.2	-31.8	56.7	₽. 0.	20.6	7.1
-9-	7.9		-	•	0.2	-1.8	-25.9	-28.3	58.2	62.1	15.7	ر. •
†		•		•	0.0	-1.4	-22.9	-23.1	60.1	62.3	18.1	10.8
ċ	7.7	5.8	64.4	•	9.0-	-2.0	-16.8	-19.2	62.8	4.84	17.7	0,4
•	7.7	•	65.4	•	-1.0	-1.0	-13.3	-14.2	65.6	ν. υ. υ.	18.0	13.4
•	5.6	•	64.1	•	-1.2	-2.4	-7.3	-10.0	62.9	68.7	10.2	4.7
12.	7.0	5.0	64.2	•	-2-3	-2.5	-2.9	7.4-	63.1	67.9	17.3	1 · · ·
16.		3.0		•		4.1		F. 0-		A. 0.		0.4
20.		7.3		62.4		.1		5 1		68.W		10.4
25.		4.9		•		٠ <u>.</u>		80,4		46.4		13.7
30.		0.5		•		-2.4		15.6		66.2		10.0
35.		4.4		•		8· \$		23.6		65.0		12.7
0		0.7		•		-2.7		26.7		62.1		7.0

TABLE IV. - D5 BULLDOZER REVERSE CONFIGURATION (CONCLUDED)

	YAW ANGLE=		95. DEG.	•								
PITCH	LIFT		DRAG	19	SIDE		PITCHING	I NG	CZIMAY	9	POLLING	UN.
ANGLE	FORCE	,,,	FORCE	ň	FORCE	ш	MOMENT	۲	MOMENT	5	MUMENT	E
(DEG.)	COEF.		COEF.	•	COEF.	•	COEF.	• iiL	COEF.	•	CUEF	•
-40	4.4		•		r.		-46.4		20.1		α. α.	
-000	3.9		65.3		7.9		-44.2		23.8		30.1	
-30.	4.8		65.5		9.4		-42.0		30.2		28 • n	
-25.	2.8		65.1		· γ		-38.9		33.2		28.4	
-20.	2.8		64.5		8.4		-35.8		37.1		27.7	
-116.	4.1		66.5		6.5		-33.3		40.4		26.7	
-120	2.7	8.3	65.7	•	9	-5.0	-29.6	-30.1	45.4	43.4	26.20	A. O.C
30	3.0	8.1	65.2	64.8	6.1	-5.3	-26.0	-27.5	44.3	46.6	25.6	10.4
7	1.0		ô6.5	•	5.5	5.5	-23.1	-24.3	47.8	48.3	25.7	74.B
•	2.6	7.2	•	•	4. 9	o. 9	-18.6	-20.3	51.9	51.K	23.4	α
•	2.4	7.4	9.99		0.9	6.9	-15.1	-15.7	51.3	56.1	24.3	20.6
	3.2	5.4	68.1	64.8	•	-7.5	-11.1	-12.8	55.0	ስ. ት	20.02	22.4
12.	3.5	5.5	56.2	•	٠ ٠	-7.1	-7.8	-8.2	54.5	5R.1	21.7	W. 10
16.		8.1		•		-8.5		-3.7		56.0		מ•ת
20,				•		-7.3		1.3		50.1		0.00
25.	•	6.3		•		0.6-		7.1		40.7		٦٩.
30.	,	4.6		•		-8.3		12.9		61.0		17.7
35.		5.1		•		8.6-		19.0		40.7		ر • بر <u>-</u>
0		. 4.3		9.99		8.8		24.2		16. A		17.F

TABLE V .- M109 FORWARD CONFIGURATION

YAW ANGLE = -90. DEG.

PITCH	LIFT		DRAG	y	SIDE	ш	PITCHING	I NG	YAWING	9N.	ROLL ING	9 2
ANGLE	FORCE	ш	FORCE	CH.	FORCE	CE	MOMENT	LZ.	MOMENT	⊢Z.	MOMENT	FZ
(DEG.)	COEF	•	COE	• 1£	COEF.	•	COEF.	•	COEF.		COEF.	•
•0	-1.8		134.4		9		-101.1		-63.2		30.0	
-35.	-0.5		134.4		6.3		-97.5		-72.5		18.6	
-30.	2.3		132,3		-8.2		-83.7		-80.0		20.1	
-25.	2.7		132.2		-7.8		-76.5		-84.4		26.3	
-20.	•		132.7		9.5-		-71.3		-90.5		20.0	
-16.	7.0		130.2		9.9		-55.9		-97.1		23.0	
-12.	5.6	5.9	131.2	•	4.9	-11.1	-49.5	-75.8	4.76-	-93.4	26.0	47.1
ė	7.0	2.0		•	9	7.8-	-43.8	-71.3	-104.5	-100.8	22.9	4A.1
•	9.1	5.B		•	? †	7.6-	-30.5	-56.9	-110.9	-102.8	24.5	44.4
ċ	13.5	0.6	132.2	•	7.5-	-5.1	-25.0	-39.8	-110.9	-1111.2	32.4	31.7
.	10.8	7.1	134.4	•	9	-8.5	-19.1	-36.3	-110.2	-1111.4	39.5	32.3
•	5.9	10.5	134.2	•	-3.2	8.4	9.6-	-24.5	-108.0	-117.8	26.2	31.5
12.	9.9	7.7	4	129.7	9.0-	6. 9	2.1	-19.2	-105.2	-113.5	23.6	31.6
16.		10.1		•		Q. 4		-9.1		-115.0		0.85 C
20.		10.3				-3.6		6.9		-1111.9		10.3
25.		8.0				0.		15.0		-114.9		22.1
30.		8.4		•		-3.1		26.8		-119.5		17.7
35.				130.8		-0 - 1		40.6		-107.1		α r,
0		13.1		135.1		5.4		58.7		-110.A		15.7

TABLE V.- MI09 FORWARD CONFIGURATION (CONTINUED)

DE G.
-60
ANGLE
YAW

ANGLE FORCE FORCE FORCE FORCE (OEF. COEF.	PITCH	LIF	!-	DRAG	و	SIDE	Йī	PITCHING	1 NG	YAWING	9 2 3	POLL ING	CN
-45.5	ANGLE	FOR	ČE	FOR	CE	FOR	CE	MOMENT	LZ	MOMENT	LZ	FNEWOW	- Z
-45.5 -39.7 -35.9 -35.9 -30.3 -27.0 -28.1 -26.1 -26.8 -147.4 -28.1 -26.1 -15.7 -18.9 -137.1 -52.3 -53.5 -18.7 -18.9 -135.0 -131.8 -53.6 -6.9 -1.0 -13.6 -53.6 -15.7 -16.9 -10.4 -135.0 -137.0 -51.1 -52.9 -15.7 -16.9 -17.0 -137.0 -51.1 -55.2 -145.1 -55.2 -140.6 -51.1 -55.2 -53.6 -53.6 -53.6 -6.9 -1.0 -13.6 -53.6 -53.6 -140.6 -53.6 -53.6 -53.6 -6.9 -1.0 -51.1 -55.9 -6.9 -1.0 -51.1 -55.9 -6.9 -1.0 -51.1 -51.0	(DEG.)	C06	•	COE	ř.	COE	F.	COEF.	•	COEF	ir.	COFF	•
-39.7 -35.9 -35.9 -35.9 -35.9 -30.3 -27.0 -28.1 -28.1 -26.8 -26.8 -26.1 -15.7 -39.1 -26.3 -26.1 -15.7 -39.1 -26.3 -26.1 -15.7 -39.1 -26.3 -34.0 -13.6 -52.8 -52.9 -53.6 -52.9 -10.4 -13.6 -52.9 -10.4 -13.6 -52.9 -10.4 -13.6 -52.9 -10.6 -51.1 -52.9 -53.6 -53.6 -53.6 -6.9 -10.1 -13.6 -52.9 -53.6 -52.9 -10.1 -51.1 -52.9 -53.6 -53.6 -53.6 -53.6 -6.9 -10.1 -51.1 -52.9 -6.9 -10.1 -51.1 -61.0 -61.0 -61.0 -61.0 -61.0	-40	-45.5		166.7		-21.3		-382.3		-80.7		-146.1	
-35.9 -30.3 -27.0 147.4 -29.3 -29.3 -26.8 141.9 137.1 -26.8 141.9 137.1 -52.3 -53.3 -53.5 -18.7 -18.9 136.3 134.2 -53.6 -6.9 -1.0 131.6 132.8 -53.6 -53.6 -6.9 -1.0 131.6 132.8 -53.6 -53.6 -6.9 -1.0 131.6 132.8 -53.6 -53.6 -6.9 -1.0 131.6 132.8 -55.2 137.0 -51.1 137.7 -52.9 140.6 55.2 140.6 56.2	-35.	-39.7		164.7		-43.6		-377.0		-118.4		-134.4	
-30.3 -27.0 147.4 -29.3 -29.3 145.3 -26.1 -26.1 -26.1 -26.1 -26.8 141.9 137.1 -52.3 -53.3 -53.5 -18.7 -18.9 136.3 134.2 -53.5 -53.6 -10.4 135.0 131.8 -55.2 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6 -53.6	-30.	-35.9		157.6		-47.6		-361.3		-152.2		-128.B	
-27.0 -29.3 -28.1 -26.8 141.9 137.1 -52.3 -26.1 -15.7 139.1 133.5 -53.5 -18.7 -18.9 136.3 134.2 -53.8 -12.2 -10.4 135.0 131.8 -55.2 -6.9 -1.0 131.6 132.8 -53.6 2.8 12.3 132.2 131.7 -52.9 15.2 19.6 132.7 137.0 -51.1 27.0 43.5 140.6 55.2 1449.2 64.3 151.0	-25.	-30.3		151.3		-51.1		-329.9		-184.0		-113.7	
-29.3 -26.1 -26.8 141.9 137.1 -52.3 -26.1 -15.7 139.1 133.5 -53.5 -18.7 -18.9 136.3 134.2 -53.5 -18.7 -18.9 136.3 134.2 -53.6 -12.2 -10.4 135.0 131.8 -55.2 -6.9 -1.0 131.6 132.8 -55.2 15.2 19.6 132.7 137.0 -51.1 27.0 34.0 139.2 34.0 137.7 61.0 149.2	-20.	-27.0		147.4		-53.3		-305.5		-212.0		-103.4	
-28.1 -26.8 141.9 137.1 -52.3 -26.1 -15.7 139.1 133.5 -53.5 -18.7 -18.9 136.3 134.2 -53.5 -12.2 -10.4 135.0 131.8 -55.2 -6.9 -1.0 131.6 132.8 -53.6 2.8 12.3 132.2 131.7 -52.9 15.2 19.6 132.7 137.0 -51.1 24.0 34.0 137.7 -51.1 61.0 149.2	-16.	-29.3		145,3		-50,0		-275.6		-237.8		1 8 8	
-26.1 -15.7 139.1 133.5 -53.5 -153.5 -158.7 -18.9 136.3 134.2 -53.8 -12.9 -1.0 131.6 132.8 -53.6 15.2 19.6 132.8 -53.6 15.2 19.6 132.2 131.7 -52.9 15.0 137.0 -51.1 61.0 64.3 151.0 151.0	-12.	-28.1	-26.8	141.9	•	-52.3	9.64-	-257.6	-262.7	-257.7	-263.4	166.4	0-14-
-18.7 -18.9 136.3 134.2 -53.8 -12.2 -10.4 135.0 131.8 -55.2 2.8 12.3 132.2 131.7 -52.9 15.2 19.6 132.7 137.0 -51.1 27.0 34.0 132.7 137.7 55.0 34.0 133.5 140.6 55.2 145.1 55.2 151.0	8	-26.1	-15.7	139.1	•	-53.5	51.3	-223.4	-222.1	-274.7	-278.1	-24.B	15.7
-12.2 -10.4 135.0 131.8 -55.2 -6.9 -1.0 131.6 132.8 -53.6 2.8 12.3 132.2 131.7 -52.9 15.2 19.6 132.7 137.0 -51.1 27.0 132.7 137.0 -51.1 64.0 132.7 137.7 64.3 140.6 64.3 151.0	Ť	-18.7		36.	•	-53.8	-53.4	-192.4	-219.9	-290.5	-300.8	1.0	0
2.8 12.3 132.2 131.7 -52.9 15.2 19.6 132.7 137.0 -51.1 27.0 34.0 137.7 43.5 140.6 55.2 1449.2 64.3 151.0	•		•	35	•	-55.2	-53.8	-174.6	-175.3	-315.7	-307.0	31.7	こったい
2.8 12.3 132.2 131.7 -52.9 15.2 19.6 132.7 137.0 -51.1 27.0 139.2 34.0 137.7 43.5 140.6 55.2 145.1 61.0 149.2	÷		1.	•	•	-53.6	-54.4	-135.4	-124.2	-321.1	-322.6	Λ 4 •	0.00
15.2 19.6 132.7 137.0 -51.1 27.0 139.2 34.0 137.7 43.5 140.6 55.2 145.1 61.0 149.2	•	•		•	•	-52.9	-52.9	-85.1	-71.3	-328.2	-332.6	113.5	145.1
27.0 139.2 34.0 137.7 43.5 140.6 55.2 145.1 61.0 149.2	12.	•	•	132.7	•	-51.1	-53.4	-29.9	-39.8	-334.7	-346.9	168.6	α•0α!
34.0 43.5 140.6 55.2 145.1 64.3	16.				•		9.64		13.3		-348.R		α.σ.α
43.5 140.6 55.2 145.1 61.0 149.2 64.3 151.0	20.		+		7		43.7		60.4		-347.3		264.0
61.0 149.2 540.3 151.0	25.				Ö		-34 . 7		129.4		-337.8		3000
61.0 149.2 64.3 151.0	30.		S.		ស		-24 . 1		193.7		-327.7		347.0
64.3 151.0	35.		61.0		•		-10.0		244.3		-311.4		354.0
	40.		64.3				5.4		282.1		-283.2		7.07r

TABLE V .- MI09 FORWARD CONFIGURATION (CONTINUED)

YAW ANGLE -30. DEG.

こうとうないできましたが、 かんという あいまっていましているとうしょう こうしゅんながん なまからない

PITCH	LIFT	ļ-	DRAG	g	SIDE	w	PITCHING	1 NG	YAWING	ING	ROLLING	ING
ANGLE	FORCE	CE	FORCE	C.F.	FORCE	CE	MOMENT	F2.	MOMENT	FZ	FNEWENT	L
(DEC.)	COE	•	COE	e EL	COEF.	•	COEF.	٠. •	COE	COEF.	CHEF	ir •
-40.	-119.0		176.5		-9.5		-767.8		95.6		-187.7	
-35.	-116.8		163.0		-25.5		-758.7		45.9		-164.1	
-30.	-1111.8		148,5		-36 •6		-735.0		5.2		-141.4	
-25.	-107.9		133.0		-43.1		-707-5		-51.0		-114.7	
-20-	-100.0		120.6		-53.9		-673.2		-132.0		-84.3	
-16.	-87.2		110.4		-58.4		600.5		-183.6		-51.7	
-12.	-76.1	-63.2	100.7	100.3	-58.3	58.4	-543.6	-513.1	-200.7	-202.7	-24.3	-10.5
-8-	-50.5	-39.2	88.7	•	-61.9	60.1	-432.3	-408.6	-214.2	-215.1	27.3	α.
†	-29.3	-18.2	83.5	85.4	-64.4	6.69	-338.6	-292.7	-234.1	-227.0	51.2	48.2
•	4.0-	4.1	79.4	•	-61.4	-59.9	-181.1	-170.4	-244.7	-243.4	91.	90.08
4	17.5	27.7	80.0	•	-56 .4	0.65	-56.5	-32.0	-235.0	-240.0	1111.4	118.3
8	40.8	52.3		87.9	-52.8	-52.5	80.9	108.9	-228.7	-278.R	138.8	149.8
12.	61.4	71.0	206	•	-45 ·B	45.9	225.8	243.7	-216.8	-225.4	177.6	183.2
16.	•	89.6		103.1		41.2		364.0		-235.0		215.0
20.		110.6		3		-32.5		514.8		-237.6		230.4
25.		130.3		131.8		-19.4		619.2		-218.4		230.7
30.		145.8		149.9		σ .		714.8		-192.2		24R.4
35.		156.1		166.1		6.4		788.8		-168.2		261 . B
40.		155.8		178.5		18.9		822.8		-136.0		770

TABLE V.- MI09 FORWARD CONFIGURATION (CONTINUED)

AWGLE FORCE FORCE FORCE FORCE FORCE MOMENT MOMENT MOMENT AWGLE FORCE FORCE FORCE FORCE MOMENT MOMENT MOMENT OPEG COEF		YAW ANGLE=		0. DEG.						۲			
FORCE FORCE COEF. COEF. MOMENT	DITCH	LIFT		DRA	()	SIDE		PITCE	5 Z I T	VAWIN	ئ	ROLL ING	ن 2
-147.3 156.3 3.4 -908.3 9.6 -1 -130.3 130.4 4.6 -818.8 7.55 -1 -118.0 10.0 7.2 -741.0 19.0 -2 -112.9 7.3 -683.2 19.0 -2 -99.4 71.4 7.3 -683.2 19.0 -2 -99.4 71.4 7.3 -683.2 19.0 -2 -99.4 71.4 7.3 -683.2 19.0 -2 -99.4 71.4 7.3 -683.2 19.0 -2 -99.4 71.4 7.3 -693.2 19.0 19.0 -2 -99.4 71.4 7.3 -683.2 19.0 -4 -99.4 71.4 7.3 -683.2 19.0 -2 -99.4 71.4 7.3 -683.2 19.0 19.0 -2 -99.4 7.1 -610.5 19.0 19.0 19.0 -2 -99.4 7.1 -610.5 19.0 19.0 19.0 -2 -99.4 7.1 -610.5 19.0 19.1 10.1 10.8 19.1 10.0 19.1 10.1 10.1 10.2 -99.4 7.1 110.8 -0.9 5.6 5.5 5.1 -2 -99.4 7.1 110.8 -0.9 5.6 5.5 5.1 -2 -99.4 7.1 110.8 -0.9 65.9 7.36.3 1.0 -2 -99.4 7.1 110.8 -0.9 65.1 10.9 65.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0 1	ANGE	FORCE		FORC	Ä	FORCE	111	MOME	LZ!	MOMEN	F	MOMENT	F2
-147.3 156.3 3.4 -908.3 9.6 7.5 -1130.4 4.6 6.5 -741.0 19.0 19.0 -112.9 7.2 -741.0 19.0 19.0 -112.9 7.3 -683.2 19.0 19.0 -99.4 7.3 -683.2 19.0 19.0 -66.5 -710.4 14.2 -64.8 -51.7 47.7 45.9 5.6 3.1 -518.0 -481.6 19.3 3.5 -64.8 -51.7 -17.6 36.2 35.1 6.5 2.4 -151.7 -121.1 20.2 6.5 -26.7 16.5 34.3 33.5 6.6 1.0 -30.8 -0.7 16.4 2.9 -30.8 -0.7 16.4 2.9 24.0 33.0 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 56.9 56.9 56.9 3.8 0.3 112.0 132.3 12.8 4.7 56.9 56.9 56.9 56.9 56.9 56.9 56.9 56.9	(DEG.)	COEF	_	COEF	•	COEF	•	COE	.F.	COEF	•	COFF	•
-130.3 -130.4 -10.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -110.0 -11	40			156.3		₩ 4		-908.3		9.6		φ. •	
-118.0 7.2 -741.0 19.0 -112.9 92.4 6.5 -710.4 14.2 -99.4 71.4 7.3 -683.2 19.0 -99.4 71.4 7.7 -610.5 19.0 -60.8 -51.7 47.7 45.9 5.6 3.1 -518.0 -481.6 19.3 3.5 -26.7 -17.6 36.2 35.1 6.5 2.1 -286.3 -287.8 19.1 4.7 -8.7 -17.6 36.2 33.5 5.4 2.4 -151.7 -121.1 20.2 6.5 -8.0 33.0 36.9 36.9 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 3.6 <th>-35</th> <th>-130.3</th> <th></th> <th>130.4</th> <th></th> <th>4</th> <th></th> <th>-818.8</th> <th></th> <th>•</th> <th></th> <th>-1.6</th> <th>•</th>	-35	-130.3		130.4		4		-818.8		•		-1.6	•
-112.9 7.3 -99.4 7.3 -99.4 7.3 -683.2 19.0 7.7 -683.2 19.0 19.0 19.0 19.0 19.0 19.0 19.0 19.0	-30	-118.0		110.0		7.2		-741.0		19.0		-2.0	•
-99.4 7.3 -683.2 19.0 -82.2 58.1 7.7 45.9 5.6 3.1 -518.0 -481.6 19.3 3.5 -46.8 -35.3 40.0 38.7 8.4 1.2 -409.9 -373.0 19.8 4.7 -26.7 -17.6 36.2 35.1 6.5 2.1 -286.3 -257.8 19.1 6.1 6.5 24.0 16.5 34.3 33.2 4.6 1.0 -30.8 -0.7 16.4 7.0 20.2 6.5 24.0 33.0 36.9 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 6.1 76.9 65.1 58.4 -1.5 372.0 460.9 -0.3 89.3 372.0 65.1 110.8 -0.5 655.5 116.8 136.1 -1.9 736.3 126.8 -0.5 136.9 33.1 136.1 -0.5 655.5 -0.5 136.3 136.1 64.8 0.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6.9 6	-25	-112.9		92.4		6.5		-710.4		14.2		-12.R	
-64.8 -51.7 47.7 45.9 5.6 3.1 -518.0 -481.6 19.3 3.5 -44.8 -55.3 40.0 36.2 35.1 -518.0 -481.6 19.3 3.5 3.5 -8.7 8.4 1.2 -409.9 -373.0 19.8 4.7 4.7 -8.2 35.1 6.5 2.1 -286.3 -257.8 19.1 10.1 10.1 10.8 19.1 10.1 10.8 19.1 10.1 10.8 19.1 10.1 10.8 19.1 10.1 10.8 19.1 10.8 19.1 10.8 19.1 10.8 19.1 10.8 19.1 10.8 19.1 10.8 136.1 10.9 10.9 10.9 10.9 10.9 10.9 10.1 10.8 137.3 10.8 136.1 10.9 10.9 10.9 10.9 10.9 10.9 10.9 10	-20.	4.66-		71.4		7.3		-683.2		19.0		0.0-	
-64.8 -51.7 47.7 45.9 5.6 3.1 -518.0 -481.6 19.3 3.5 -44.8 -35.3 40.0 38.7 8.4 1.2 -409.9 -373.0 19.8 4.7 -26.7 -17.6 36.2 35.1 6.5 2.1 -286.3 -257.8 19.1 6.1 -8.0 16.5 34.3 33.5 5.4 2.4 -151.7 -121.1 20.2 6.5 24.0 33.0 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 24.0 33.0 36.9 3.8 0.3 112.0 132.3 12.8 4.7 37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.6 66.1 58.4 -1.5 372.0 -0.3 -0.7 16.4 2.1 116.8 136.1 -1.9 736.3 -0.5 137.3 164.8 0.9	-16.	-82.2		58.1		7.7		-610.5		18.4		-10.0	
-44.6 -35.3 40.0 38.7 8.4 1.2 -409.9 -373.0 19.8 4.7 -26.7 -17.6 36.2 33.1 6.5 2.1 -286.3 -257.8 19.1 6.1 -8.7 0.7 35.2 33.5 5.4 2.4 -151.7 -121.1 20.2 6.5 8.0 16.5 34.3 33.2 4.6 1.0 -30.8 -0.7 16.4 2.9 24.0 33.0 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.5 66.1 58.4 -1.5 37.2 259.5 9.3 3.5 76.9 65.9 -0.3 237.2 259.5 9.3 3.5 76.9 65.9 -0.3 237.2 259.5 9.3 3.5 100.1 110.8 -0.5 571.4 -2.3 116.8 136.1 -1.9 736.3 -0.5 137.3 164.8 0.9 831.1 5.0 -5.0	-12.	·	S	47.7	•	5.6	3.1	-518.0	-481.6	19.3	ر. د.	1.5° 4	ν. •
-26.7 -17.6 36.2 35.1 6.5 2.1 -286.3 -257.8 19.1 6.1 -8.7 0.7 35.2 33.5 5.4 2.4 -151.7 -121.1 20.2 6.5 24.0 35.2 34.3 33.5 4.6 1.0 -30.8 -0.7 16.4 2.9 24.0 33.0 36.9 3.8 0.3 112.0 132.3 12.8 4.7 37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.5 66.1 58.4 -1.5 372.0 460.9 3.5 -6.3 372.0 76.9 65.9 -2.6 460.9 -2.5 460.9 -2.3 -3.7 89.3 110.8 -2.2 571.4 -3.7 -3.7 116.8 136.1 -1.9 736.3 -3.1 137.3 164.8 0.9 -3.6 55.5 -3.2 10.9 137.3 136.3 136.1 -1.9 -1.5 -2.5			.35,3	•	•	ά) 4	1.2	-409.9	-373.0	19.8	4.7	9.7-	c • -
-8.7 0.7 35.2 33.5 5.4 2.4 -151.7 -121.1 20.2 6.5 24.0 16.5 34.3 33.2 4.6 1.0 -30.8 -0.7 16.4 2.9 24.0 33.0 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.5 76.9 65.9 -2.6 460.9 -2.5 460.9 -6.3 3.5 89.3 89.2 -2.6 460.9 -2.3 -2.2 571.4 -3.7 102.1 110.8 136.1 -1.9 736.3 -0.5 -3.7 116.8 136.1 -0.5 831.1 -0.6 -0.5 -0.5 -0.5	*	~	-17.6		•	6.5	2.1	-286.3	-257.8	19.1	5.1	α • •	α•[-
8.0 16.5 34.3 33.2 4.6 1.0 -30.8 -0.7 16.4 2.9 24.0 33.0 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.5 76.9 65.9 3.5 -0.3 237.2 460.9 -5.1 89.3 89.2 -2.6 460.9 -6.3 -6.3 102.1 110.8 136.1 -1.9 736.3 -0.5 116.8 136.1 -1.9 736.3 -0.6	•	-8.7	•	•	•	₽• Ĉ	2.4	-151.7	-121.1	20.2	6.5	-2.1	c c
24.0 33.0 36.9 36.9 3.8 0.3 112.0 132.3 12.8 4.7 37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.5 66.1 58.4 -1.5 372.0 -6.1 76.9 65.9 -2.2 460.9 -0.3 89.2 -2.2 571.4 -3.7 116.8 136.1 -1.9 736.3 -0.5 137.3 164.8 0.9 831.1 5.0	*		16.5	•	•		1.0	-30.8	-0 - 1	16.4	0.2	y•ルー	o c
37.9 50.5 43.3 46.0 3.5 -0.3 237.2 259.5 9.3 3.5 66.1 58.4 -1.5 372.0 -5.1 76.9 65.9 -2.6 460.9 -0.3 89.2 -2.2 571.4 -3.7 102.1 110.8 -0.5 655.5 -3.7 116.8 136.1 -1.9 736.3 -0.6 137.3 164.8 0.9 831.1 5.0	¢	24.0	33.0		•		0.3	112.0		12.A	4.7	0	-0.7
66.1 58.4 -1.5 372.0 76.9 65.9 2.6 460.9 89.2 -2.2 571.4 102.1 110.8 -0.5 655.5 116.8 136.1 -1.9 736.3 137.3 164.8 0.9 831.1	12.		50.5	M	•		-0-3	237.2		•	۲, ۳,	Č	•
76.9 65.9 2.6 460.9 89.3 89.2 -2.2 571.4 102.1 110.8 -0.5 655.5 116.8 136.1 -1.9 736.3 137.3 164.8 0.9 831.1	16.		66.1		•		-1.5		372.0		٠٩٠]		ا را • ل
89.3 89.2 -2.2 571.4 102.1 110.8 -0.5 655.5 116.8 136.1 -1.9 736.3 137.3 164.8 0.9 831.1	20.		76.9		•		-2.6		460.9		۲, • ٥-		0 0 0 1
102.1 110.8 -0.5 655.5 116.8 136.1 -1.9 736.3 137.3 164.8 0.9 831.1	25.		•		•		-2.5		571.4		ر. ا		7.1
116.8 136.1 -1.9 736.3 -0 137.3 164.8 0.9 831.1	30.	-	102.1		110.8		-0.5		655.5		1.8.1		α • !' !
137.3 164.8 0.9 831.1 <	35.	-	116.8		136.1		-1.9		736.3		မ် င		0.4
	40.		137.3				6.0		831.1				t. •

TABLE V.- M109 FORWARD CONFIGURATION (CONTINUED)

DEG.

YAW ANGLE=

PITCH	LIFT	DRAG		SIDE	1.1	PITCHING	SALWAY		CM1 - 100	<u>(</u>
ANGLE	FORCE	FORCE		FORCE	щ		FNERCM			S +
(DFG.)	COEF.	COEF.		COEF.	•	COEF.	COEF		COFF	- •
-04-	-144.1	158.1		3.7		6.906-	-32.3	4	Q.	
-35	-129.9	135.1		14.1		-817.4	-24.5) - -	0 '5	
-30•	-119.8	113.6		15.5		-745.6	19.7	•	3.0	
-25.	-111.6	94.1		15.9		-700.0	22.6	,	7	
-50•	-100.8	74.7		16.3		-689.6	30.0	1	מיותו	
-16.	-81.3	60.1		15.3		-613.1	41.7	ī	- 1 A	
-12.	-64.0 -51.7	50.0	~	15.1	12.1	-511.9 -483.2	45.9 32.7		0.0[7
٠ ٣	-47.0 -35.6	4 1.	0	15.4	11.5				-16.2	1 C C
•		8,8	iO	15.8	9.5	-	49.6 39.9	•	. m	- 6 - 7
•	Q	7.0 3	m	13.8	10.9	-160.1 -130.7			1.0.1 R.O.1	α
4	~	4		13.9	11.0	-14.0 -8.4				
8.	30.0 35.7	8.	0	1.2.4	12.0	136.6 147.6		·	1.5.0	6 7 1 -
12.	0	4 4	7.8	10.9	8.5		5.6	•	-14.6	, o c -
16.	•	ũ	Oh.		8.7	382.7			•	
20.	76.4	7	0		8.3	470.4	10 10 10	1-		α
25.	91.8	ŭ			5.8	590.4	27.6	ú		- 2 - 1
30.	104.5	113			-1.5	674.5	- K.	ú		· v
35.	121.7	139	5.6		-10.5	758.6	A. KC-	ζ,		· · · · · · · · · · · · · · · · · · ·
40.	139.6	16.	3.7		-20.5	852.0	2°02-	^	·	-26 K

TABLE V.- M109 FORWARD CONFIGURATION (CONTINUED)

THE REPORT OF THE PARTY OF THE

	YAW ANGLE=	ZGLE=	8. DEG.	•								
PITCH	1961	-	DRAC	IJ	SIDE		PITCHING	ING	YAWING	92	POLL ING	N ك I N ك
ANGLE	FORC	1	FORCE	E C	FORCE	in i	MOMENT	12	MOMENT	Ę	FNEWCM	Fo
(DEG.)	COEF.	•	COEF.	• Ii.	COEF.	•	COEF.	•	COEF.	•	COEF.	•
-40	-134.4		159.4		11.2		-859.1		6.49-		53.0	
-35	-131.9		139.3		19.7		-823.8		-48.3		32 . R	
-30	-121.9		119.1		22.4		-762.1		7.3		0	
-25.	-112.7		98.7		56.9		-732.6		24.9		0.4	
-50.	-102.7		79.1		25.7		695.9		49.8		-27.3	
-16.	-85.4		64.6		24.4		-626.3		6.09		-30.5	
-12.	-68.4	-55.2	54.5	•	55.9	23.8	-537.3	-491.8	77.0	68.3	-2B.B	-15.1
-8-	-45.7	-37.8	48.1	8	55.9	25.4	-416.0	-386.2	7.67	67.6	-25.6	-10.7
•	-27.2	-18.4	43.2	6	24.9	21.8	0.462-	-265.7	87.5	75.4	-25.9	ς 0 1
Ċ	9.6-	-1.1	41.5	7	25.1	21.3	-156.8	-138.1	94.5	α. α.	120.h	M. * C. T.
*	9.6	17.2	41.5	6	23.7	20.2	-15.5	4 • 8	98•5	85.28	-24 · C	0 · a1 -
æ	28.9	36.8	44.1	42.7	22.0	50.9	125.3	140.4	86.2	70.2	A. AC-	K • U U -
12.		54.3	49.9	-	21.4	18.8	261.2	271.6	82.8	76.6	-31.F	a
16.		71.7		1 5		17.4		364.8		7.3.A		0.00
20.		85.6		•		16.0		508.4		4.77		1001-
25.		97.6		6		10.0		0.609		0.04		-14.3
30.		111.9		•		-1.0		705.1		ω. « α.		5.02-
35.		138.3		6		-20.4		816.5		-31.2		0 • a K t
0		148.1		163.7		-33.1		8,66,8		7.24-		C • < 5

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TABLE V.- MI 09 FURWARD CONFIGURATION (CONTINUED)

	YAW A	YAW ANGLE=	16. DEG.	•								
PITCH	LIFT	-	ראאפ	ٯ	SIDE		PITCHING	I NG	YAWING	ى ع	ROLLING	UZ.
ANGLE	FORCE	CE	FORCE	C.F.	FORCE	щ	MOMENT	L Z	LNEWOW	FZ	LNEWOW	HZ
(DEG.)	COEF.	· LL	COEF.	•	COEF.	•	COEF.	• Ψ.	COEF.	•	CHEF	•
.64	-131.2		166.4		7.1		-833.0		-86.1		101.9	
-35.	-128.5		150.2	•	20.1		-832.6		-60.0		70.8	
-30•	-121.7		132.3		32.9		-798.8		-1.4		31.7	
-25.	-110.3		•		38.8		-740.7		34.9		14.5	
-20•	-114.4		94.9		41.0		-789.0		58.0		-10.4	
-16.	0.06-		79.3		44.9		-670.5		109.6		7-40-7	
-12.	-72.6	-61.1	68.8	63.1	45.8	41.1	-571.9	-534.4	127.8	117.6	-38.0	-23.3
-8-	-54.6	-40.6	62.8	2	42.8	39.8	7.644.	7.604-	143.9	120.2	-32.0	170.4
•	-28.6	-20.5	œ	53.0	42.6	38.4	-300 0	-281.8	154.8	141.5	0.78-	リーングー
•	-9.3	-1.3	55.7	0	42.0	38.5	-175.1	-152.9	163.6	146.7	-44.3	-34·F
*	10.6	21.1		51.7	39.0	37.6	-36 • 1	4.9	169.6	151.6	-43.K	U • U ∷ −
80	30.4	39.8	57.1	55.7	37.3	33.9	121.5	130.8	158.2	151.1	0-17-	2 · (4-
12.	52.9	63.1	•	63.7	35 .5	32.4	565.9	288.7	162.0	15.4	-7H.F	-7" 6
16.		84.9		75.3		30.4		424.7		160.4		ម ម ជ
20.		101.6				23.5		541.8		153.3		7.06-
25.		125.6		80		6.4		689.1		105.5		0.14-
30.		143.6		127.4		-5.9		807.3		5.02		1001-
35.		156.1		149.8		-21.3		860.6		10.2		-103.0
40.		162.0		168.6		-33°B		897.1		1.2		-11.

TABLE V .- MIO9 FCRW FRD CONFIGURATION (CONTINUED)

CH LIFT DRAG SIDE PITCH G. COEF. COEF. COEF. G. COEF. COEF. G. COEF. COEF. COEF. G. CO		YAW ANGLE		30, DEG.	•								
FORCE FORCE FORCE MOMES -117.6 -117.6 -123.6 -116.9 -116.9 -116.3 -116.9 -116.3 -116.9 -116.3 -116.9 -116.3 -116.9 -116.3 -116.3 -123.6 -116.3 -123.6 -123.6 -123.6 -123.6 -123.6 -123.6 -127.3 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -124.9 -122.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.9 -126.	PITCH	. 1 L	 -	DRA	ی	SIDE		PITCE	ING	PANINGY	ن Z	ROLLING	I NC
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-123.6	-40.	17.		177.9		12.7		-761.7		-84.3		183.7	
-114.9 -110.3 -110.3 -110.3 138.6 -99.5 124.9 153.8 -90.5 117.0 -90.5 117.0 -90.5 117.0 -90.5 117.0 -90.5 117.0 -90.5 117.0 -90.5 117.0 -90.5 -90.5 -90.5 -90.6 -17.1 -1.4 -90.2 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -50.0 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -714.5 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7 -60.7	-35	-123.6		69		27.3		9.622-		-26.7		164.9	
-110.3 -124.9 -99.5 -90.3 -17.0 -90.3 -17.0 -90.3 -17.0 -59.1 -74.4 -74.4 -74.4 -59.1 -74.5 -74.5 -60.4 -60.7 -74.5 -60.4 -60.7 -74.5 -60.4 -60.7 -74.5 -60.4 -60.7 -74.5 -60.4 -74.5 -74.5 -60.7 -60.7 -60.7 -74.5 -60.7 -60.7 -60.7 -60.6 -74.5 -60.7 -60.7 -60.6 -74.5 -74.5 -60.7 -60.7 -60.7 -60.6 -74.5 -74.5 -60.7 -60.7 -60.6 -74.5 -74.5 -60.7 -60.7 -60.7 -60.6 -74.5 -74.5 -60.7 -60.7 -60.7 -74.5 -74.5 -60.7 -60.7 -74.5 -74.5 -74.5 -60.7 -74.5 -60.7 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.5 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.6 -74.	-30.	-114.9		53.		41.5		-759.2		20.0		143.6	
-99.5 124.9 17.0 61.2 -90.3 117.0 61.2 -604.8 108.8 108.8 103.2 62.7 58.0 -522.0 -59.1 -44.4 100.4 96.2 63.2 63.3 60.1 -434.7 -17.1 -1.4 89.3 86.2 63.3 60.4 -212.9 10.7 21.1 87.4 82.7 59.8 56.7 -69.6 36.9 56.7 -69.6 114.5 114.5 114.5 114.5 114.5 114.6 133.0 -5.6	-25.	-110.3		38		46.0		-714.5		66.5		114.3	
-90.3 -78.2 -66.9 108.8 103.2 62.7 58.0 -522.0 -59.1 -44.4 100.4 96.2 63.2 60.1 -434.7 -37.8 -23.9 93.6 88.9 63.3 60.5 -332.6 -17.1 -1.4 89.3 86.2 63.3 60.4 -212.9 10.7 21.1 87.4 82.7 59.8 56.7 -69.6 36.9 50.6 87.6 85.9 54.2 50.2 66.5 64.0 75.0 95.3 93.5 51.4 48.2 212.5 114.5 114.5 114.5 19.2 133.6 133.0 19.2	-20.	-99.5		24		55 ,9		-66 7 00		132.8		7.40	
-78.2 -66.9 108.8 103.2 62.7 56.0 -522.0 -59.1 -44.4 100.4 96.2 63.2 60.1 -434.7 -37.8 -23.9 93.6 88.9 63.3 60.5 -332.6 10.7 21.1 87.4 82.7 59.8 56.7 -69.6 56.5 56.9 56.5 56.5 56.5 56.5 56.5	-16.	-90.3		17		61.2		604.8		194.7		وں• ح	
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-17.1 -1.4 89.3 86.2 63.3 60.4 -212.9 10.7 21.1 87.4 82.7 59.8 56.7 -69.6 36.9 50.6 87.6 85.9 54.2 50.2 66.5 64.0 75.0 95.3 93.5 51.4 48.2 212.5 114.5 114.5 114.5 33.0 144.8 149.0 5.1	i	37.	-23.9	93.6	•	63.3	60.5	-332.6	-298.5	260.1	248.4	-34.9	3. 12-
10.7 21.1 87.4 82.7 59.8 56.7 36.9 50.2 36.9 50.6 87.6 85.9 54.2 50.2 64.0 75.0 95.3 93.5 51.4 48.2 114.5 114.5 133.0 19.2 144.8 149.0 5.1 153.7 164.0 -5.6	ċ	17.	-1.4	0		63.3	60.4	-212.9	-173.9	265 • R	251.6	5° 0 5-1	0.1.1.
8. 36.9 50.6 87.6 85.9 54.2 50.2 66. 2. 64.0 75.0 95.3 93.5 51.4 48.2 212. 5. 114.5 102.2 42.7 0. 114.5 114.5 33.0 5. 133.6 133.0 19.2 6. 144.8 149.0 5.1 6. 153.7 164.0 5.1	•	10.7	21.1	~		89.65	56.7	9.69	-39.5	261.8	248.9	-04.7	11011
2. 64.0 75.0 95.3 93.5 51.4 48.2 212. 6. 92.4 102.2 42.7 0. 114.5 114.5 33.0 5. 133.6 133.0 19.2 0. 144.8 149.0 5.1 6. 153.7 164.0 -5.6	œ.	36.9	50.6		•	54 •2	50.5	66.5	119.7	252.2	245.0	-126.0	-141.5
6. 92.4 102.2 0. 114.5 114.5 5. 133.6 133.0 0. 144.8 149.0 6. 153.7 164.0	12.	64.0	75.0	5	•		48.2	212.5	267.3	246.7	240.4	-166.6	-1 a a • -
0. 114.5 114.5 S. 133.6 133.0 0. 144.8 149.0 R. 153.7 164.0	16.				•		42.7		384.2		236.0		4.100-
56 133.6 133.0 0 144.8 149.0 6 153.7 164.0	20.		114.5		•		33.0		508.4		256.2		d * E c 2 -
A. 144.8 149.0	25.				•		19.2		618.1		107.0		E * サビィー
153.7 164.0	30.				•		5.1		722.6		175.3		6. 120-
	35.		153.7		•		9.5		804.2		¥. 451		*******
40. 158.4 178.3 -23.8			80		8		23		839.4		1 30 . 1		- 206-

TABLE V.- MIO9 FORWARD CONFIGURATION (CONTINUED)

いっこう こうかん 一世の神神神経の経験のとのから中央の地域の一年後にあるのであるが、ここのできる まるのは、そのないのであるとのない

1. The second se

	YAW ANGLE=		45. DEG.	•							
PITCH	LIFT		DRAG	y	S IDE		PITCHING	CZIMAX	ن 2	CNI	ن 2
ANGLE	FORCE	w	FORCE	CE	FORCE	ļų.	MOMENT.		: <u>-</u>		; - 2
(DFG.)	COEF	•	COEF	•	COEF.	•	COEF.	COEF		COFF	. • ! li.
.64	-79.5		178.0		22.7		-535.7	0.1		160.0	
-35.	-80.3		171.4		33.1		-551.3	45.3		160.5	
-30•	-78.3		163.2		43.4		-546.0	87.2		151.8	
-28.	-71.8		156.3		53.6		-528.7	128.6		155,8	
-20.	-56.5		147.7		62.0		-489.6	161.3		142.0	
-16.	-50.0		139.1		62.5		-437.3	193.8	•	108	
-12.	-45.6	-42.2	136.3	128.2	67.0	62.0	-395.4 -399.9	231.8	224.2	78.6	76.0
÷	-36.1	-29.6	131.6	•	0.69	62.2	-350.0 -340.3	262.1	247.4	45.4	0 6.8
*	-21.6	-14.2	124.5	•	67.0	63.5	-280.8 -249.0	279.5	0.440	υ• ヤ	-10° ¤
•	-8-U	9.0	120.6	•	65.1	61.8	-213.6 -179.9	286.3	2 R 1 . 7	n 00-	-60.0
•	6.2	13.9	121.1	117.0	62.4	61.1	-132.4 -120.3	301.1	302.0	-A7 G	-107.5
æ	23.9	15.2	121.5	•	2.69	57.2	52.2 -36.5	320.1	4.00%	-13347	-174.6
12.	30.7	39.0	124.4	•	57.1	56.7		322.3	306.5	-101-	7.576-
16.		56.7		128.1		50.3	177.7		204.05		0 4 5 a c 1
20.		9.07		•		39.1	284.8		000 000		4. 38-
25.		88.6		136.6		52.9	4004		272.3		0
30.		105.9		•		11.9	491.5		247.9		A. CAL-
38.		1111.9		156.2		0.7	549.0		219.4		0.135-
0		117,3		169.9		-12.5	697.0		100.0		105-

TABLE V.- M109 FORWARD CONFIGURATION (CONTINUED)

YAW ANGLE= 60. DEG.

PITCH	LIF	-	DRA	و	SIDE		PITCHING	JING	CZIMAY	2	-	0N1 1 00
ANGLE	FORCE	CE	FORCE	ÇE	FORCE	'n	MOMENT	FZ	LULWOW	- 2	LAMACA	12
(DEG.)	COEF.	•	COEF.	.	COEF.	•	Ö	COEF.	COEF		COFF	. .
-04-	-41.7		170.4		29.3		-392.1		80.00		134.5	
-35.	-41.4				36.7		-407.6		12: 4		141.9	
-30.	-40.5		164.6		39.3		-388.4		157.0		135.1	
-25.	-37.9		159.6		42.7		-362.2		192.3		133.0	
-20.	-32.9		153.3		45.8		-321.6		216.5		115.2	
-16.	-30.6		152.3		48.3		.301.1		239.3		102.7	
-12.	-28.8	-30.5	146.5	138.4	48.7	42.6	-271.6	-293.1	254.6	245.0	מ מ	50.1
	-32.7	-27.7	145.7	139.6	50.0	46.8	-264.6	-277.0	273.5	268.1	υ α ν•	1 1-
•	-21.6	-30.5	141.4	139.2	52.2	48.6	-243.7	-263.3	291.5	285.1	4 1	ν,
•	-16.8	~28.9	139.7	•	52.8	51.7	-217.1	-233.9	312.0	308.0	17.4	מ ריין
•	-24.3	-23.2	140.2	135.8	53.7	50.8	-199.5	-182.0	322.5	307.5	13K.7	י ומ-
¢	-26.5	-14.1	141.3	•	56 . 1	52.9	-157.7	-131.0	331.2	310,1	ו מעו	0.00
12.	-15.1	-2.7	141.4	•	55.5	52.3	-101.7	-76.0	338.1	7.21.5	-137.3	4 6 4 6 1
16.		17.2		140.2		48.3		-7.5		334.3	•	-212.
20.		27.4		8		41.1		45.7		330.1		-251
25.		39.7				32.6		107.8		324.9		1286
30.		49.6		•		23.6		171.4		4. t.		400
35.		55.4		148.2		12.1		225.0		301.0		7 - 7 7 2 -
+0.		65.0		148.5		-2.0		271.1		282.1		1260

TABLE V.- MI09 FORWARD CONFIGURATION (CONTINUED)

PITCH LIFT ANGLE FORCE (DFG.) COEF.										
		DRAC	ເສ	S IDE		PITCHING	YAWING	υz	PULLING	50
		FORCE	1	FORCE	ш	MOMENT	MOMENT	FZ	HZHWCW	F
		COEF.	•	COEF.	•	COEF.	COFF	•	COFF	•
-4013,5		155.7		13.0		-234.1	107.9		97.0	
. •		157.3		19.8		-228.7	131.6		91.1	
-309.8		154.9		26.2		-220.7	147.2		8. W. R.	
-2511.5		155,6		26.4		-216.9	176.6		ر. د.	
-2011.4		154.3		29.1		-206.9	192.2		76.5	
-167.5		149.4		27.8		-192.7	201.3		71.9	
-127.1	-7.1	145,9	141.2	28.4	25.1	-179.5 -172.4	209.4	212.7	α. α.	7.07
•	4.4-	146.8	1.8.4	30.4	26.3	-164.1 -162.0	227.0	0.066	40.7	7.82
-4.	-7.7	146.1	139.2	28.3	26.3	-150.3 -150.9	236.R	0.256	40.1	1 a
-2.6	-7.4	144.7	•	30.6	27.5	-128.4 -138.4	242.7	255.7	45.0	α. •
-3.7	-17.9	140.7		30.0	9.62	-115.1 -139.8	248.1	264.5	4 0 K	(° •) (°)
-1.6	-19.8	141.0	140.8	8.62	32.0	-89.1 -122.5	262.4	4.276	4.51	· •
-0-7	-18.9	139.6	•	30.7	34.6	-69.1 -104.4	262.1	7.10C	r α .	٠,
14.	-22.1		•		36.4	-88.3		Jar.		5.0
	-19.1		136.9		36.0	162.6		4.1.00		•
	-14.6		136.3		34.8	-36.1		200		•
	-12.5		•		36.2	ト・ グー		a . O C E.		•
. K.	-7.3		137.7		35.2	20.1		α• ξοε		K
•0•	-4.3		136.9		31.7	44.0		0000		-130-1

TABLE V .- MI09 FORWARD CONFIGURATION (CONTINUED)

90. DE G.

YAW ANGLE=

PITCH	LIFT	<u>F</u>	DRAG	9	S IDE		PITCHING	+ I NG	TAMING	<u>د</u> 2	POLLING	ואט ו
ANGLF	FOR	CE	FOR	CE	FURCE	ш	MOMENT	L	FUEWUW	۲	FNUMCA	۲
(DEG.)	COEF.	ų.	COEF.	•	COEF.	•	COEF.	•	COFF.	•	C OFF	•
-40.	-15.2		145.9		-11.2		-144.0		48.3		-14.5	
-35.	-19.5		146.5		-11.6		-140.1		48.4		-23.2	
-30.	-12.1		142.3		5.1		-122.7		6.99		-27.5	
-25.	₩. O -		140.1		-1.2		-1111.3		76.0		-27.3	
-20.	-9.0		137.7		-0-2		-103.9		87.7		-30.3	
-15.	2.5		138.0		9°E		-91.8		88.6		v• a < 1	
-12.	-2.7	-24.9	134.6	•	3.1	-2.4	-79.2	-119.5	0.66	7 A . K	-32.1	7 - 44 - 5
	0.1	-26.4	137.5	136.5	3.7	-0.5	-75.2	-116.7	4.66	0°0 a	-43.2	1-44-1
•	3.5	-13.6	134.8	•	6.4	3.0	61.7	-101.3	108.9	7.40	7-62-7	7 3E -
ċ	6.8	-29.7	134.4	137.5	6.4	4 • 8	-45.8	6.66-	110.1	107 0	7.48-	143.
*	3.1	-24.6	133.9	8	4.4	4.	-37.0	-92.3	114.2	116.7	4.4.4	1.00-
ď	10.8	-14.6		133.3	4.0	5.9	-27.2	-76.2	116.0	115.7	-36.1	
12.	5.4	-10.3	135.7	۲.	3.1	6.3	-19.7	6.07-	114.1		7.50	
16.		-11.1		135.7		5.5		-51.5		1 40 - 1		•
20.		9.0-		133.1		2.8		-40.2		4.001		•
25.		-7.1		134.5		,, • o		5.55-		C • · * [· ·
30.		7.0-		133.2		6. 4		114.4		α • O ε ε		•
35.		-2.2		134.2		3.3		U				;
40.4		-8.9		136.3		9.6		I.		3 [

TABLE V.- M:09 FORWARD CONFIGURATION (CONCLUDED)

95. DEG.

YAW ANGLE=

PITCH	: IFT		DRAG	ن	SIDE	111	PITCHING	J N C	YAWING	じっ	ROLL ING	UN.
ANGLE	FURCE		FORCE	E C	FORCE	E C	MOMENT	⊢Z	MOMENT	۱	LNUMUM	FZ
(DEG.)	COEF		COEF	•	COEF.	•	COEF.	•	COEF	• H	COFF	п
0 7	-26,5		143.1		-21.1		-142.1		2.9		-62 • B	
-35.	-26.7		142.9		-19.9		-134.6		15.8		-63.1	
-30.	-21.2		142.1		-11.4		-133.4		28.4		-60.1	
-25.	-4-1		144.6		4.4		-121.0		40.8		21.4	
-20.	-15.0		141.2		o. 9		-114.8		48.5		-47.0	
-16.	-19.6		140.9		-8.7		-107.2		54.5		-63.3	
-12.	-0.5	8.1	134.4	•	-3.1	0.5	-79.4	-120.8	61.5	30.3	-45.7	α•1-11
6	ıO	-8.5		•	-0-7	-2.1	-82.0	-119.8	67.6	46.3	-56.1	164.K
•	6.1 -1	0.41	134.6	•	0	-2.9	-71.6	-116.1	75.5	ر ب ال	0.88-	F. 9 K. 0-
•	0.	9.6-	135.0	134.0	-3.1	9.0-	-55.4	-100.3	73.2	64.4	7-22-	C. 74-
•	6.	-7.8		•	m.	-2.4	-42.1	9.06-	72.9	71.5	0.861	P 44 .
æ	1.07	8.5	137.2	0	-3.5	0.4	50.7	-61.1	2.06	81.1	C. ar-	C . t n .
. 12.	8	15.4	137.5	129.6	4.2	-7.5	-44.0	-42.9	7.84	72.3	0.00.1	ソ・ロリー
16.	-	14.1		130.2		-7.1		-33.6		74.0		7.05-
20.		18,3		131.0		-10.5		-24.5		α. υ.		7.54
25.	•	•		N		-11.4		-16.1		<. cα		α • α c +
30.		18.2		134.4		-14.5		0.1		7 a . K		-10.7
35.	•	20.5		132.6		-19.3		14.0		7.77		1:
40.	,	17.0				-18.5		24.7		ر. د. م		5

TABLE VI.- M109 REVERSE CONFIGURATION

PITCH	LIFT	-	DRAG	₉	SIDE	Ш	PITCHING	9	YAWING	ڻ ع	POLL ING	U Z
ANGLE	FORC	'n	FOR	CE	FORCE	CE	MOMENT		MOMEN	<u>.</u> Z	FUHMOM	 Z
(DEG.)	COEF	•	OEF.	•	COEF.	· iL	COEF.		COEF.	•	COFF	• U.
-40.	2.7		133.6		-12.9		59.0		174.1		15.9	
-35.	-3.B		133.6		6. 4-		43.7		180.5		39.4	
-30.	2.0		133,9		-9.5		31.3		187.9		15.0	
-25.	5.4		134.5		-10.9		20.2		183.3		17.3	
-20•	3.4		133.7		-10.0		-1.9		188.0		30.4	
-16.	3.0				-7.0		-10.4		191.1		27.5	
-12.	-0.7	-4.2	133.7	130.4	₽.8-	6.6-	-24.0	-57.7	189.7	211.2	67.0	70.7
. 8-	-0-1	-3.2	134.2	129.6	0.8-	-11.2		-70.0	184.4	199.4	4 7	, I.
	2.2	6.3	133.7	129.7	-7.8	-10.6		-68.5	181.2	185.6	N. 9. 1	10.0
•	5.2	-6.8	133.3	129.8	7.7-	-11.2	69.0	-91.3	178.1	180.7	7.8 °C	ν C
*	9.7	5.2	•	128.7	4.0	8.6-		-95.5	159.4	173.1	57.0	α Ι
¢	1.4	-0.3	133.6	121.0	5.9	-8.2	1	-114.5	167.4	174.8	J. A.	1 1 1 1
12.	5.4	4.0-	136.9	132.6	5.5	9.6-	-88.8 -1	-126.7	156.4	177.44	K.F. 4	
16.		10.2		128.4		7.7-	- 1	-117.2		146.2		10.0
20.		12.3		132.7		4.1	-1	-120.7		14:.7		00-
25.		3.0		132.8		9.6-	-1	-147.6		130.3		7
30.		13.2		129.6		4.	i	-143.4		100.7		7 % "
35,		12.7		130.3		L1.	1-	-156.4		10 . 4		
40.4		0		0 000			•					

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

ANGLE FORCE FORCE FORCE MOMENT YAWING ANGLE FORCE FORCE MOMENT WOMENT COEF. COEF. COEF. COEF. COEF. COEF. COEF. -40. -25.6 156.8 -26.7 -51.6 96.2 COEF. -36. -21.6 151.6 -29.4 -58.9 79.2 79.2 -36. -17.4 149.0 -35.1 -58.9 79.2 79.2 -26. -17.4 149.0 -35.9 -58.9 79.2 79.2 -26. -17.4 149.0 -35.1 -58.9 79.2 79.2 -26. -17.4 149.0 -35.9 -26.7 -26.9 48.0 79.2 -18. -18. 126.9 -26.0 -24.1 -69.9 -92.6 48.0 -18. -70. -28.0 -26.7 -26.7 -26.0 -24.9 48.0 72.0 -8. -4.0 <		YAW AI	YAW ANGLE= -60.	50. DEG.	٠								
FORCE FORCE COEF. MOMENT MOMENT COEF. -25.6	PITCH	LIF	-	DRA	ٯ	SID	Ш	PITCH	1 NG	YAWI	ڻ ع	ROLLING	ت ا
-25.6	ANGLE	FOR	CE	FOR	Č E	FOR	CE	MOM	⊢Z	MOME	- 2	HUMMENT	۲
-25.6 156.8 -26.7 -51.6 79.2 -21.6 151.6 -29.4 -58.9 79.2 -10.5 144.0 -35.1 -63.2 79.2 -10.5 136.6 -32.0 -69.0 48.0 -5.3 136.6 -32.1 -69.0 48.0 -6.0 -2.8 126.9 -26.0 -24.1 43.9 -7.0 -2.8 126.9 -26.0 -24.1 43.9 43.9 -7.0 -2.8 126.9 -26.0 -24.1 43.9 43.9 -7.0 -2.8 126.9 -26.0 -24.9 -92.6 30.1 35.5 -4.3 -19.8 126.0 -24.9 -92.6 30.1 35.5 -4.3 -19.8 126.0 -24.9 -92.6 30.1 35.5 -3.0 -4.1 -69.9 -92.6 30.1 35.4 -4.3 -19.8 -26.7 -24.9 -92.6 30.1 35.4 -5.7 124.2 -21.7 -21.7 -10.7 -10.1 <	(DEC.)	C0E1	.	COE	ė LL.	COE	·	CCE	٠	COE	• LL	COFF	• u
-21.6	-40.	25.		•		-26.7		-51.6		96.2		72.1	
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15. 30.4 143.3 -5.9 -111.8 0. 35.3 147.0 7.7 -109.7	30.		7		œ,		-11.6		-107.4		-141,2		الواء في
0. 35.3 147.0 7.7 -109.7	35.		0		m		5.5		-1111.8		-142.7		8.011
			ຕໍ່		7		7.7		-109.7		-169.0		? ¢ ¥

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

YAW ANGLE= -30. DEG.

PITCH	LIFT		DRA	g	SIDE	Й	PITCHING	5N.	YAWING	<u>ს</u>	SNI I Da	2
ANGLE	FORCE	įų)	FORCE	CE	FURCE	CE	MOMENT	F-7	TNUMENT		FNEWCM) <u> </u>
(DEG.)	COEF	•	COEF.	•	COEF.	т	COEF	•	COEF	. • . ii	COFF	. •
-04-	-82.0		175.8		-33.2		34.2		107.1		8.406	
-35•	-75.1		160.4		-37.3		20.9		87.3		193.0	
-30•	-62.1		145.1		40.4		23.7		20.6		180.4	
-25.	-57.9		136.9		4.04-		5.6		58.4		182.1	
-20•	-43.0		123.5		-34.3		19.2		51.6		174.0	
-16.	-33.7		•		-29.9		42.7		59.6		160.R	
-12.	_	-15.2	108.9	_	-15.1	-10.9	41.0	1 .2	73.9	101.2	133.9	٦ 2 3
-8-	-19.5	4.6-		•	0.6-	-8.2	46.2	-30.3	95.3	97.0	110.1	ብ መ
•	-16.3	3.0	100.8	98.1	-8.7	6.5	-5.7	-42.1	92.3	94 .	72.1	0 0 0 0
•	-1.9			_	4	-3.0	-11.5	-31.2	86.0	81.0	f. 1 . 3	34.5
	•	•	98.6	-	-2.2	-0.3	-7.3	-2.1	77.3	72.0	្រ មេ	C . K 79
œ	33,3	•		-	-0 - 2	2,2	-18.7	-21.9	57.9	4 1 ° B	0 10 0	in.
12.	•	48.6	110.8	•	-0.5	5.3	-21.6	-25.9	22.R	21.6	M M	27.0
16.		ċ		117.2		-0-1		-7.1		() ()	• •	r 1
20.				•		-2.3		13.6		α		i G
25.		61.7		ທ		-3.6		43.4		-31.7		0
30.		67.9		4		-1.9		73.4		0001		٠. ٧ ل
35.		77.1		ū		7.8		84.1		ر • الا الا الدين ال الدين الدين ال		
40.		79.4		163.5		17.7		81.8		, m		. 0 ;

TABLE VI .- MI09 REVERSE CONFIGURATION (CONTINUED)

DEG.

YAW ANGLE=

PITCH	LIFT	L	DRAG	o	SIDE		PITCHING	ING	YAWING	97	POLLING	92
ANGLE	FOR	Ш	FOR	E E	FURCE	Ш	MOMENT	۲	MOMENT	۱	MOMENT	F2
(DEC•)	COEF	•	COEF.	tr.	COEF	•	COEF.	•	COFF.	•	COFF	
-40	-74.1		134.5		-3.6		136.7		7 • 1		٦. ٩.	
-35.	-67.2		118.6		2.0		134.3		25.4		3.7	
30.	-52.0		105.2		3.1		133.3		18.7		15.7	
5.	-43.0		•		5.1		148.5		0.4		٨.	
-20-	-31.9				0.0		175.4		-7.8		ە ب	
•	-27.4		79.7		0.3		187.0		-12.4		1.6	
-12.	-20.2	-10.1	71.5	68.5	6°0	8.0	215.0	212.3	A . A-	1.0	1.4	0.6
-8-	-23.3	-12.9	65.7	64.1	1 • 1	2.1	235.0	218.4	-5.2	6.0-	1.1	ر ب
•	-12.6	-1.9	62.0	61.1	2 •6	0.0	208.3	154.3	1.5	4.4	o • c	4.6
•0	-5.2	-0-7	67.9	64.1	1.3	1.0	103.5	36.2	-10.7	-4.0	1.0	0
•	4.9	-5.5	6.99	73.5	2 • 8	-0-1	-58.7	-68.0	-18.3	r 0 -	4.0	ړ. ب
8.	10.3	0.5	71.6	78.5	ۍ . د	2.2	7.65	-47.6	-3.2	w. 0.	7.47	ر د د
e Ai	21.9	10.8	57.0	83 .3	6.4	1.6	-13.1	0.0	٠. ب	0. 0	الم • ا	l,
•9		25.1		0.06		1.8		74.4		4:2-		r (
•		35.0		7. 66		1.2		104.2		a : 1-1		
5.		49.1		112.3		-1.6		127.6		01		i •
•		56.9		126.4		-1.4		137.2		-7.5		•
ů,		71.4		147.7		1.6		102.2		٠. • •		.; .; .;
40.		78.5		166.8		0.5		118.1		ا د د		· .

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=	4GLE=	4. DEG.	•								
PITCH	LIFI	•	DRA	g	SIDE		PITCHING	ING	YAWING	٥ V	ROLL ING	SN.
ANGLE	FORCE	'n	FORCE	CE	FORCE	ш	MOMENT	- 2	MOMENT	۲	MOMENT	Ļ
(DEG.)	COEF.	•	COEF	•	COEF.	•	COEF.	•	COEF.	•	COFF.	
-00	-67.1		127.1		10.9		134.1		-17.6		-32.9	
100	-50.4		116.6		6.6		128.4		-44.3		-29.1	
-30.	-53.2		107.8		7.6		132.8		-46.6		-31.6	
-25	-43.2		97.3		8.9		144.9		-45.7		-33.2	
-20-	-31.7		86.6		•		162.9		-36.0		-33.1	
-15.	-25.0		79.4		7.7		183.1		-32.7		125.0	
-12-	-18.4	-8.8	74.3	70.8	6. 4	2.4	217.6	213.9	-30.2	-27.9	-26.0	Œ
4	-16.6	-6.8	68.6	62.9	6.4	3.8	203.9	185.7	-39.7	-44.4	-26.2	-23
•	-5.9	4.0	65.5	64.3	4.0	4.4	173.2	146.9	-58.1	-56.9	-21.5	01-
	-2.5	9.2	65.7	64.0	5.3	4.6	95.5	44.8	-65.6	-41.4	۴.	0 -
•	6.7	12.7	70.0	71.7	3.2		-35.7	80.8	-60.0	0.04-	α. •	o
, a	17.7		71.5	75.8	7.8	8.0	-27.8	-36.3	-38.8	-43.0	4	ı,
12.	22.0	18.3	78.0	83.3	8.8	8.2	-1.5	11.1	-27.9	-30.5	0.0-	114
16.		28.0		91.3		11.0		56.6		-20.5		-20
20.		40.3		102.1		6° 8		92.4		-16.6		р С.
25.		34.0		1 05 . 7		8.0		170.1		12.2		125
30.		57.1		126.1		7.8		133.3		11.4		-11
35.		69.3		144.7		-2.5		113.3		15.5		۲-
0		82.0		164.1		-16.1		148.6		א, גרן		ןי יון

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=		8. DEG.	_								
PITCH	LIFT		DRAG	15	SIDE		PITCHING	NG	YAWING	٥ N	ROLLING	ING
ANGLE	FORCE		FORC	Ä	FORCE	W	MOMENT	- 2	MOMENT	FZ	MOMENT	FZ
(DEG.)	COEF.		COEF.	•	COEF.	•	COEF.	•	COEF.	•	COEF	•
-40	-74.2		136.9		15.5		125.2		-70.5		-68.7	
-35	-64.3		124.2		16.1		127.0		-63.8		-62.1	
-30.	-53,3		110.1		16.0		132.1		-60.5		-58.5	
-25.	-42.2		100.3		17.4		143.7		-70.6		-55.3	
-20.	-34.0		8.06		14.5		165.9		-58.4		-57.2	
-16.	-23.4		83.0		14.2		176.9		7.74-		-56.3	
-12.	-14.2 -4	4.2	76.8	73.9	14.8	10.0	205.6	184.7	-42.9	-53.8	-4·	-35.1
6	6.8-	1.5	73.2	•	10.4	6.5	191.5	174.1	-77.4	0.96-	- 53.5	-41.0
•	-5.0	3.0	71.3	68.3	7 • 3	6.2	156.8	109.5	-94.5	-104.1	-40.0	-28.4
•	2.1 14	6.4		68.4	5.0	6.4	80.6	25.0	-83.3	-R2.6	-17.7	-4.0
4	•	•	71.3	•	3.9	6.8	8.2	-67.7	-74.2	148.5	ر 4	10.2
•	15.8 24	•	78.6	•	7.0	8.4	-72.9	-96.5	-61.2	ر. ۳. ۳.	15.2	17.2
12.	25.7 31	1.7		•	0.0	ខ្មុំ	-48.6	-58.0	-41.1	-40.6	13.6	11.7
16.	42	2.3		98.4		0•9		6.4-		-26.0		۳, • پ
20.	43	3.7		1 05 • 1		11.0		74.8		-27.5		ر ا م•
25.	54	4. 9		116.8		90 4•		114.0		-13.4		a • 0 × -
30.	99	8.9		133.1		0 • 9		118.0		ψ. α.		1.8.4
35.	7	76.3		148.4		7.2		137.9		73.6		 • √
•0•	82	2.7		162.7		-20.5		170.0		a .		2

TABLE VI .- M109 REVERSE CONFIGURATION (CONTINUED)

DE 6.

16.

-21.0 1 2 4 30. A 0.75 1.50 E ۲. ۵۴. 6. 5. -42.0 ROLL ING MOMENT COEF 24.9 -84.0 -75.R -128.9 -122.7 -113.1 0.96--86.2 -43.7 -11.4 -66.2 19.2 • 0.0 14.0 -132.6 -129.5 -30.0 10.4 -125.4 -85.7 -76.6 -65.0 YAWING MOMENT COEF. -73.0 -107.3 -110.8 -83.6 -76.5 -107.7 -113.9 -84.2 -80.1 -61.9 -45.6 -71.5 -89.7 -93.2 -20.8 57.6 2.4 -78.4 101.3 130.9 141.6 61.9 36.6 -57.4 PITCHING MOMENT COEF. 75.3 95.5 97.5 106.3 1 16 .6 13.2 -72.6 101.0 124.1 142.0 61.6 10.9 11.4 -19.0 3.9 ω. φ. ο 7.5 6.2 11.6 13.1 FORCE COEF. SIDE 30.2 30.8 34.8 30.9 6.6 5.9 15.7 8.1 25.6 33.7 26.1 92.0 6.66 141.2 82.0 80.8 85.7 80.1 108.8 118.0 131.1 53.1 DRAG Force COEF. 125.9 103.5 138.8 113.6 94.6 89.7 81.9 84.7 85.2 81.7 67.1 -1.6 16.8 15.4 40.5 55.3 74.4 78.7 85.4 26.1 82.3 YAW ANGLE= FORCE COEF. LIFT -43.3 -3.4 E.0--8.3 -77.8 -71.6 -29.8 3.1 -60.1 -17.2 9.1 (DEG.) 20. PITCH -30. -20. 12. 30. -40. -35. -25. -12. • • 8 25. ANGLE -16. -8-† 16. 35.

JP.

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

いというないと言うない

	YAW ANGLE=		30. DEG.	•								
DITCH	1 17 1		DRAG	ى	SIDE		PITCHING	9N 1	YAWING	NG	ROLL ING	SNS
ANG B	FORCE	111	FORCE	3	FORCE	ш	MO MENT	トフ	MOMENT	⊢Z	MOMENT	⊢ 7
(DEG.)	COEF	۱ •	COEF.	•	COEF.	•	COEF.	•	COEF.	•	COFF	•
40	-74.2		170.7		32.0		15.8		-136.1		-160.1	
1 P			157.0		39.5		9		-130.2		-136.5	
-30-	-50.5		146.1		40.6		 φ		-113.2		-127.6	
-25.	40.4		136.8		38.1		-22.4		-82.8		-133.2	
-20•	-37.2		127.4		32.3		4.7-		-78.6		-122.4	
-16.	-23.7		119.1		28.1		4.3		-80.8		-110.1	
-15.	~	-10.9	114.5	107.6	17.9	15.3	17.6	-13.4	-101.2	-105.7	-97.2	-51.0
6	-19.5	-9.5	107.6	104.5	15.2	14.9	12.4	-47.5	-100.9	-104.0	-81.3	-34·0
1	-12.9	1.2	105.2	100.3	18.1	13.8	-39.0	-63.3	-93.3	-101-8	-53.6	-21.1
ć	E - C -	10.0	103.7	101.7	14.6	11.9	-42.3	-60.3	6.68-	-66.3	-34.6	-K.7
•	15.9	22.7	105,3	107.9	11.5	8.3	-32.8	-54.3	-89.0	-82	-13.8	, ,
C	_	30.4	108.3	110.8	10.7	3.0	16.1	-33.8	A-69-	-67.0	-37.7	-17.7
12.	25.7	43.6	115,1	115.4	5.8	1.9	-0-2	-11.7	8 · C 4-	7.UP-	-44.1	-22.E
16.		48.0		121.1		9.1		8.4		0.0		-6.7 . F
200		57.3		0		9.3		32.3		20.7		1.75-
26.				139.2		9.1		58.1		21.6		194.0
30.		•		œ		1.0		82.9		α•9#		ハ・ロソー
1 to 10 to 1		73.6		158.5		-2.2		94.8		10.7		- L- U
40.		77.5		167.8		-14.2		93.8		17.7		α α •

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

рттсн	LIFT	.	DRAG	g	SIDE		PITCHING	ING	CAIMEX	<u>ن</u> ع	יוטש	POLLING
ANGLE	FORCE	Ä	FOR	CE	FORCE	щ	MOMENT	FZ	MOMENT	2	HNUM	FZ
(DEG.)	COEF	.•	COEF.	ė ik	COEF.	.•	COEF.	•	COEF.	•	COFFF	· LL
-40	-59.2		173.8		27.3		-53.0		-132.0		-121.3	
-35.	-48.3		166.5		32.2		7.97-		-114.5		-100.5	
-30.	-41.1		156.8		33.6		-95.5		-89.4		-82.6	
-25.	-38.6		148.5		31.4		-104.3		-74.3		-61.2	
-20.	-37.7		141.5		27.2		-102.6	•	-71.2		-46.2	
-16.	-33.6		135.4		24.1		-93.5		-67.4		-47.2	
-12.	-24.1	4.4-	131.2	122.6	24.0	25 • 1	-95.7	8.76-	-60.1	-46.F	८.º ∪₽-	-14.7
-8-	-9.1	•	127.7		26.2	24 . 1	-84.5	-78.5	-50.3	-40.5	-37.1	A-1 4-
• •	4.2	7.8	123.6		24.1	21.0	9.99	-63.8	-35.4	-35.7	-41.7	-FO.4
•	11.6	21.7	121.9	120.3	21.5	19.1	-46.5	-56.1	-29.9	-21.8	-66.1	0-04-
•	20.9	27.5	122.5	•	18.9	17.6	-34.7	-30.4	-14.3	-12.6	-92.5	-07.
8	33.0	36.4	126.4		15.6	14.1	-14.7	-16.4	-7.2	4.0	-110.4	-100.2
12.	36.1	44.4	129.4	129.8	10.7	10.8	6.1	8.8	11.0	16.4	-123.3	-110.
16.		47.6		132.7		9.5		8.6-		40.3		-124.7
20.		54.7		•		& • 8		0.5		50 . A		-130
25.		55.6				3.6		-0.2		62.1		-111.4
30.		57.2		152.4		1.3		8.5		73.1		-04.7
35.		58.1		160.1		-3.8		0.6		α. r.		- 12 11 • ر
40.		60.1		168.1		-12.5		-3.6		5.42		1. 1.

TABLE VI .- M109 REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLE=		60. DEG.	_								
OTTCH			DRAG		SILE	*	PITCHING	I NG	YAWING	NG NG	ROLL ING	ING
	FORCE		FORCE	'n	FORCE	'n	MOMENT	LN	MOMENT	- Z	HOMENT	۲
(DE6.	•		COEF.		COEF.	•	COEF.	• <u>u</u> .	COEF.	•	C NEF.	•
-	-14°		161.8		35.7		-30.8		4.66-		-45	
- B			160.0		33.6		-52.3		-83.2		α •	
001			152.7		37.3		4.09		-80.9		25.3	
-28			147.1		37.7		-67.7		-72.0		41.9	
-20-			147.8		37,0		-70.6		-59.4		43.5	
-	0.0		141.2		31.9		-70.8		-49.1		37.3	
-12	-13.4	9.9-	138.7	132.0	59.6	26.1	-89.2	-102.4	-40.6	-35.8	14.2	-10.3
	***	-5.9	137.5	•	31.4	27.5	-93.4	-104.1	-30.0	-4.6	O • O	1-67.0
		-3.5	132.8	130.5	28.5	27.3	-98.3	4.66-	-14.8	α •	-16.7	-96.4
Ġ	-1.9	1.5	133.9	130.2	28.4	26.0	8.96-	-101-8	-11.2	23.6	-45.R	₽.011
	4.60		133.3	•	25.1	30.4	9.66-	-105.2	20.5	47.5	-82.7	1144.4
	0.0	12.7	132.0	•	25.5	28.5	-94.6	-95.1	39.6	ر. م	-124.6	-165.5
2	4.4.	18.6	135.7	134.5	25.1	26.8	-86.2	-84.9	55.7	71.0	-140.4	-188.7
4	7V	24.9		•		22.6		-79.5		73.5		0.001-
20.	77	24.2		139.5		23.2		82.0		96.3		0.006-
S.		30.9		141.9		18.3		-78.7		120.1		-182.4
P		33.6		146.3		15.2		-91.1		140.4		-140.
	[*]	30.7		•		10.1		8.68-		145.5		-15.
0	[M]	38,3		155.7		-0 - 8		-98.6		148.7		, • C /-

TABLE VI.- MIO9 REVERSE CONFIGURATION (CONTINUED)

	YAW ANGLEE	75. DEG.	•								
PITCH	LIFT	DRA	₉	S 10E		PITCHING	9	TAWING	ن ح	ROLL ING	
ANGLE	FORCE	FORCE		FORCE	Ш	MOMENT	-	MOMENT	۱	HUMMON	
(DEC.)	COEF.	COEF.	•	COEF.	•	COEF.	•	COEF.	•	COEF.	
•04-	9.5	145.0		38.0		22.7		-76.2		21.6	
-38.	9.3	144.9		36 •6		10.8		-74.2		13.7	
-30.	11.8	141.3		34.8		3.2		-76.2		15.5	
-25.	14.0	141.6		32.6		-4.5		-63.6		55.0	
-20•	10.1	142.0		31.7		4.9		-62.7		12.1	
-16.	17.0	139.7		31.4		-22.3		-55.5		11.5	
-12.	16.7 0.9	140.1	131.9	28.5	21.9		-66.2	-52.3	-18.6	9.0 -38.7	^
6	-	137.8	129.1	26.3	21.6	-29.5	-81.0	-44.2	F. 91	11.2 -45.4	4
†	m	5 140.3	131 .8	26.6	22.5	-43.2	-86.5	-34.3	υ. α•	6.9 -51.	_
•	12.8 -2.3	13	130.7	23.3	24.1	6.55-	-102.4	-27.8	24.5	16.7 -75.	l.
•	•	13	Ö	22.0	24.4	62.3	115.2	-12.1	31.2	-15.3 -47.	,
¢	7.3 -6.5	132.0	131.5	21.6	25.8	6.69	125.4	-10.1	45.0	-24.0 -100.2	٨
12.	3.5 -4.4	133,8	130.1	22 • 3	26.3	-85.7 -	-129.6	A.A.	F1.7	-40.3 -107.2	o.
16.	4.1.		129.8		25.4	•	-137.7		5. A. A. W.	-1.10.	lí.
20.	-2.1		131.3		26.5	1	-136.5		73.5	-100.	α
25.	9.0-		129.5		27.5	1	-137.3		0.50	-117.	ľ
30.	2.7		130.4		24 .3	Å	-135.8		111.5	E. COI-	۴,
35.	3.8	•	1 32 . 9		25.6	•	-135.3		125.4	* · C D -	j
•0•	3.2	A 1	130.8		52.9	1	-138.7		133.6	ν. 1 α	Ĺ

TABLE VI.- M109 REVERSE CONFIGURATION (CONTINUED)

	VAW ANGLE=	# 90. DEG.	•						
7,0	- 4	DR4	9	SIDE	PI TCHI NG	YAWING	9	ROLL ING	ن 7
		FOF	FORCE	FORCE	MOMENT	MOMENT	H-7	MUMBRI	-
(066.)	COEF	COE	COEF.	coef.	COEF.	COEF.	•	COFF	•
•		138.2		5.5	77.5	-173.3		-18.4	
	•	0		6.3	65.4	-171.8		-13.3	
	-6.2	137.0		8.4	48.2	-179.3		-34.4	
-88-	F. 6.3	137.8		3.3	37.1	-190.2		-30°4	
-50	-5.5°	135.6		5.1	. 17.3	-177.0		-36.9	
-16.	-0-3	137.0		5,4	6.4	-186.1		-50.5	
	0-1 -7	.2 136.5	131.4	5.7 8.8	-4.6 -68.7	-187.9	-167.5	-42 • E	-36.
	-0-1	S	_	5.9 9.2	-18.2 -74.1	-186.6	-167.1	-47.5	-42.
		_	131.7	4.3 9.5	-27.8 -79.0	-180.3	-167.6	-42.3	-46.
	1	7	132		-39.7	-191.2	-165.B		-34.
		5 138	-	5.4 8.7		-190.5	-152.2	-4F.R	-4 R •
	•	139	131 •3	-	6.66- 8.83-	-180.6	-1 < 1 . 0	0.07-	-42.
	1.2-	139	131.2	6.1 10.6	-84.4 -105.7	-184.6	-141.7	165.3	142.
			130.0	7.1	9.66-		-130.F		٠ ۲
	-		130.5	11.1	-109.5		-135.9		-25
	-	-	130.8	10.6	-116.5		-125.8		0 -
• C F	e e	, m	131.4	10.7	-128.7		-123.0		-22
	•	60	132.0	8.3	-137.0		-110.5		-00-
0		•	132.0	-0.5	-132.0		-106.3		۲-

TABLE VI .- MI 09 REVERSE CONFIGURATION (CONCLUDED)

And the transformation and the same and the

	W MYA	YAW ANGLE= 9	95. DEG.	•								
PITCH	LIFT	-	DRAG	ٯ	S 10E	ш	PITCHING	ING	YAWING	92	ROLLING	C Z
ANGLE	FORCE	CE	FORCE	CE	FURCE	CE	MOMENT	TN.	MOMENT	1 2	MUMENT	<u>+</u>
(DEG.)	COEF.	•	COEF.	•	COEF.	•	COEF.	•	COEF.	т. •	CNEF.	•
-04-	-19.2		146.0		-20.9		55.8		-254.6		ก 0	
-35.	-7.9		145.1		-14.9		54.0		-253.2		14.3	
-30.	-17.4		145.8		-18.4		26.7		-260.0		-1.4	
-25.	-14.0		143.8		-15.7		13.5		-249.4		₩	
-20.	3.8		141.0		-11.5		18.7		-250.1		α 3	
-16.	-1.9		143.5		-12.9		7.9		-252.4		0.8-	
-12.	4.6	-1.1	140.5	142.1	-13.2	-8.8	-17.2	-45.3	-249.2	-237.9	2.4	ሰ የ
E 1	5.0	-10.5	144.3	137.0	-13.2	7.7-	-30.7	-62.7	-244 .R	-240.2	-1.8	4.74
•	S	7.2	140.3	138.2	-12.9	-11.5	-41.5	-45.0	-242.4	-244.4	-20.1	54.4
•	1.1	11.9	145.4	135.0	-14.9	-12.3	68.0	-55.0	-235.0	-235.4	-16.1	٥,١٨
*	2.3	7.6	145.9	140.5	-17.8	-14.9	-77.3	4.69-	-231.A	-227.9	Y. C 2-	40.K
8	-1.6	7.8	144.5	133.8	-11.6	-10.6	-104.9	-81.7	-225.5	-210.K	8.15-	30.6
12.	0.0-	13.6	145.2	138.3	-12.4	-17.7	-106.5	-96.1	-223.R	-213.4	4.68-	и. С и
16.		10.4		139.7		-17.1		-102.9		-217.4		44.0
20.		7.0		142.3		-16.0		-129.5		p*(002-		٥.
25.		10.2		142.0		-17.6		-141.0		-194.2		0.00
30.		5.9		143.3		-15.5		-159.8		-178.6		: 00
33.		9.9		140.8		-17.0		-161.3		-164.1		3.36
•0•		5.5		142.5		-16.0		-181.4		-14a.		

ABLE VII .- MIO9 FORWARD CONFIGURATION WITH MACHINE GUN

10000	FORCE	FORCE	PORC	, n . !	SID	m M	PITCHING	9 L Z	Y A W I N G	9 - 2	ROLL ING	ს V F
(0000)	COEF.	DELTA	COEF.	DELTA	COEF.	DEF. DELTA	Ö	DELTA	COEF.	DELTA	COFF.	DFLTA
	AAW AI	ANGLE	0. DEG.									
-12.	-	0.1	45.7	-0-1	3.3	0.2	-473.9	7.7	0.8	7.2-	4.6	8.3
•	-36.5	-1.2	39.1	•	2.9	1.6	-381.9	-8.9	4.3	4.0-	1.4	0.3
-4-	-17.7	0.0-	35.1	0.0	3.1	ڻ• 0	-247.5	10.3	4 • 8	.1.3	-0 · B	1.0
•0	-0.8	-1.5	34.2	•	2 • 5	0.1	-129.0	-7.8	6.0	-0.5	-1.1	-1.2
•	15.4	-1.0	•	•	1.0	0.0	3.6	4.4	1.0-	-3.6	1.0	1.0
•	31.8	-1.2	37.9	1.0	-0-1	-0.5	135.6	3.3	2.2	-2.5	1.1	1.0
12.	48.2	-2.3	47.0	•	0.5	6.0	259.4	0.0	ម្ចិ	0.0	0.0	1.6
	63.2	•	57.9	•	0.5	2.0	367.1	6.4-	-2.3	2.7	4.0-	4.5
	75.5	-1.4	9*69	-0.2	-2.6	0.0-	465.5	4.6	-5.1	4 • 1	15.4	۳. ۱۳.
25.	86.8		88.0	•	-2.5	0.0	564.3	-7.1	-1.0	2.2	2.2	3.4
30.	9.86	-3.5	107.8	-2.9	-2 • 1	-1.6	656.6	1.0	-1.7	1.0	v.	10.1
35.	16	•	134.8	•	25	-0.2	744.6	8.2	-2.4	7.0	9.6	4.7
40.	•		162.6		7.4-	-5.6	850.9	19.8	4.3	-1.6	15.4	B. O.
	N MAY	ANGLE= 9	90. 7EG.	•								
-12.	-28.4	-3.5	141.7	6.7	-2.3	0.0	-126.9	-7.4	93.1	14.4	98.9	3 • €
		•	142.6	6.1	-1.0	4.0-	-117.0	-0-3	7.16	7.8	-40.8	η. υ.
•	-2646	-12.9	139.7		1.1	-1.9	-109.0	-7.6	106.4	11.6	-33.7	a -
•	-26.8	2.9	140.5		4.8	0.0-	9. 26-	2.3	104.8	-3.1	-28.5	10.5
•	-20.1	•	137.6	-0-3	4.7	0.3	-86.3	5.9	107.8	σ•α-	ਜ਼. ਜ਼.ਵ ਜ਼.ਵ ਜ਼.ਵ ਜ਼.ਵ ਜ਼.ਵ ਜ਼.ਵ ਜ਼.ਵ ਜ	-
•	-23.5	-8.9	138.8		6.1	0.2	-76.0	0.1	121.9	6.5	-38 · 0	ς. α.
12.	-23.3	-4.0	139.0	1.3	8.7	9.0	0.83.	6. 8	126.3	بر 10°	-24.3	23.0
16.	-22.5	-11.3	142.8		10.6	5.4	-56 • 1		132.7	1.9	-20.9	11.2
20.	-17.6	-17.0	~		6.9	9. 9	-44.3		128.8	3 • O	-28.1	17.8
20.00	-15.1	-8.0	Ø		10.2	3.9	-32.5		129.5	4.4-	-24.3	11.
30.	-14.1	4.6-	135.3	2.1	11.9	7.1	-15.4		126.5	-3.2	4.8-	14.7
35.	-11.4	-9.5	133.7		11.6	8.2	0.4		131.0	13.0	-12.1	29.
	,		1	•	1	•			: !	(1	1

TABLE VIII.- REYNOLDS NO. = .9 X 10**6 DATA

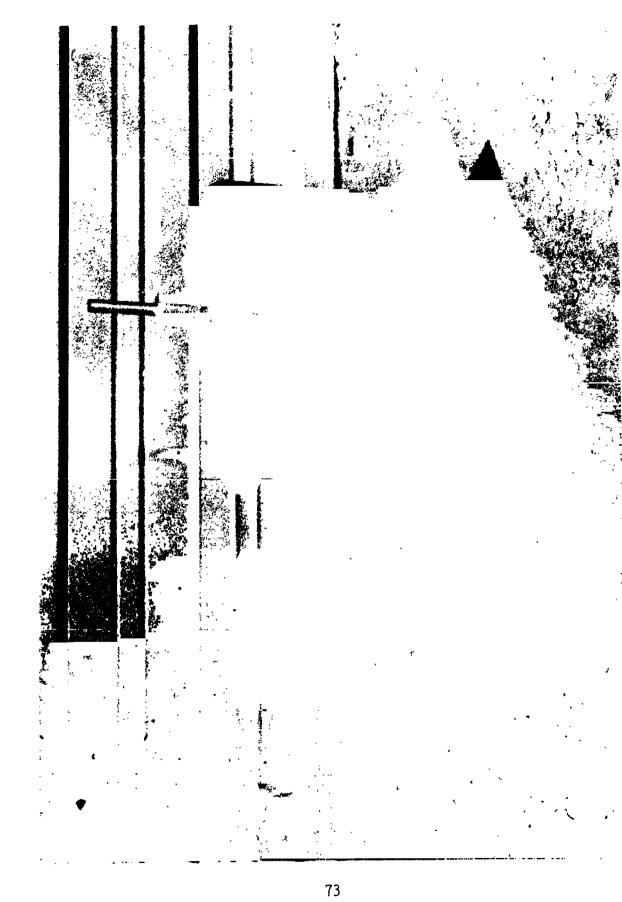
ANG P	LIFT FORCE	₩ H- C	DRAG	ш O O	S IDE FORCI	E CE	PITCHING	1 NG	YAWING	<u>ს</u> ⊢ 2 Z	POLL ING	ნ N I F Z
(DEG.)	COEF	DELTA	COEF.	F. DELTA	COEF. DE	DELTA	COEF.	UZF. DELTA	COEF. DF	DFLTA	COFF. DF	DFLTA
	YAW AP	ANGLE=	O. DEG	•		05	5 BULLOOZER	ZER FOR	FORWARD CON	CONFIGURATION	Z C	
-12.	-13.5	0.1	25.4	1.0	0.3	0.8	5.7	2 • 4	2.2	-3.A	1.4	0.7
-8-	-10.3	-0.7	23.3	•	-0-3	-0.2	13.0	2.8	4 • 3	-4.7	1.2	0
-4-	-5.8	-0.8	•	0.3	-0,7	-0.5	19.0	0.8	ស ស	0.0	1 • 1	0.4
•	-0-3	-1.6	22.6	1.3	9.0-	0.5	27.4	2.5	æ•æ		a.	K. • C
4	_	4.0	23.8	•	9.0	0.8	28.5	1.0	8.0		0 C	0.7
	7.2	-0.5	24.5	•	S• 0	6.0	40.6	5.5	3.7		1.6	· -
12.	11.8	-0.7	•	•	0.1	0.1	41.7	2.0	4 . 7		φ. «	*
16.	16.5	-2.0	•	. 2 • 4	1.0	1.0	39.4	0.3	2.7	0.2	1.6	0-
20.	21.9	-2.3	31.6	•	9.0-	-2.2	39.5	1.2	-2.3		2.1	7.0-
25.	28.5	1.8	35.9	•	4.0	0.5	36.7	-7.6	1.0		9.4	-
30.	32.3	-1.2	43.1	•	1.0	7.0	31.1	6.0	-0 - 1		1.0	-0-
35.	36.9	-1.2	50.8	1.8	2.2	0.0	26.5	0.0	2 • 1		-1- c•1-	4
0	39.8	0.0	57.5	•	2.4	1.0	15.1	7.0	1.1	-0 8	-1.1	િ (
	Y WAY	ANGLE=	O. DEG.	•			DS BULL	BULLD02ER/BLADE		CONFIGURATION	NO	
-12.	-13.8	1.2	50.7	1 • 4	0 • 2		-131.1	6.0-	6.8	4 • 0	α C	ά.
-8-	-13.3	1.4	45.6	1.7	-0-3		-116.5	-0.7	8.2	2.4	1.1	c
•	-12.5	1 • 1	39.8	1.6	0.5	-1.3	-120.2	1.9	5.0	0.0	1.6	-
•	-14.2	-0.5	35.5	1.0	0.7		-141.93	1.6	6.4	1 • 3	1.0	- 1
4	-11.5	4.0-	34.2	1.4	9.0		-156.3	1.6	9.5	٧•٥	1.2	c
ć	-7.1	0.2	36.5	в• 0	8.0-		-167.9	-0-7	9.2	7.F	1 • 1	c
12.	ឆ ុ	-1.3	43.8	4 • 0	-2 •4	φ. 4	-180.4	-20.7	8.6	7.9	7.4	ċ
16.	•		51.6		Z• 0 -	-1.8	-161.1	-12.5	11.9	7 0	7.5	ċ
20.	2.8	0.1	55.0	•	9,0-	-2.4	-14C.7	4.8	0.9	1 • 3	٠ ٧ •	C.
25.	80 13	0.2	60.3	1.4	0.7	-0-1	7.16-	1 • 1	α. •S	ر. د	C P	(
30.	•	6.0-	67.2	1.0	0.0-	0.5.	0.99	0.0	α. Ι	T. J.	k b	¥ • ¥
35.	18.0	-0.5		•	-0-2	-2.2	-35.6	4.0	1 • 4	 J	7.5	
	,			•	3	4	2	•		,	r	

TABLE VIII. - REYNULUS NU. = .9 X 10 **6 DATA (CONCLUDED)

FORCE COEF. DE	E DEL TA	PRAGE FORCE COEF, DI	G CE Delta	SIDE FURCE CUEF D	E CE DELTA	PITCHING MUMENT	ING NT DELTA	Y AW ING MOMENT	N N N N N N N N N N N N N N N N N N N	POLLING MOMFNT	ENG FI
YAW ANGLE	. 11	O. DEG.	 			3	W109 FORWARD COMETCHEATTON			• L	
)		,	I	,	,	i.			L K C C C		
	-	•	-3.0	7.0	-1.3	-4/3.8	7.8	8.7	ۍ 1.	α ~	ر ه
	5,3	36.8	-1.9	-0-3	-1.6	-377.8	-4.7	13.7	8.0	6•0	-0-1
	3.2	33,3	-1.7	8. 0-	-3.0	-261.6	-3.B	14.3	8.1	0.7	ν. α
	1.9	32,3	-1.1	-1.4	-3.8	-144.7	-23.5	12.6	6.1	α • c	V • 0
	3°E	33,3	0.1	-1.9	6.2-	-16.1	-15.4	11.1	8.1	1.5	ر م
	4.5	39.2		-2 • <u>9</u>	-3.3	1111.1	-21.2	13.5	a a	1.7	ر. ر
	5° 6	47.2		-3.8	-3.4	237.8	-21.6	2.5	0.1-	1.3	3.0
	4.0	58,9	0.5	φ. Φ.	-3.3	354.5	-17.5	Z • 0-	4.0	٧.٥	5.7
	J. 53	71.6		4. 7-	₽. 4	444.4	-16.4	-1.6	7.6	0 • y	c • c
	2.3	89.4	0.2	-8.5	£.9	549.5	-21.9	ac ex	12.0	1.7	3.0
	2.5	111.0		-5 • 1	4.5	632.2	-23.3	2.7	α. •	1.2	٦. ١٠
	2 . 8	138,8		φ. φ	4.7	717.5	-13.7	7 - 1	14.6	f.	α • O
	0.7	167.4	2.5	-2.7	-3.6	815.5	-15.5	16.7	10.7	12.2	4.0

TABLE IX. - M109 FORWARD CONFIGURATION DATA REPEATABILITY CHECK

U	FLOCE	FLOOR		ָם װ	S. L.	ı L		9 Z +		S F	MOMENT	: E
(DEG.)	COEF.	DELTA	COEF. DE	DELTA	COEF. DE	DELTA	COEF. DI	DELTA	COEF. DE	DFLTA	COFF	DFLTA
	4 M4 Y	ANGLE=	0. DEG	•								
-12.	-52.0	-0.2	•	0.3	2.5	-0.5	5 -477.1	4	4.6	1.1	1 • 1	-1.1
-8-	-35.8	4.0-	38.7	0.0-	2.6	1.3	-374.3	-1.2	4.3	4.0-	1.1	Ċ
•	-17.7	0.0-	36.1	1.0	3.2	1.1	-239.9		5.2	6.0-	ן: • C	1.3
•	-1.9	-2.7	35.0	1.5	2 • 3	0.0-	-131.8		3.7	1. A. B.	-0-B	0-01
•	14.9	-1.6	34.0	8.0	1.1	0.1	1.0		4.0	1.1	0.7	1.6
8	32.5	-0.5	•	4.0	0.4	0.0	130.9		0.0	7.4-	0.5	-
12.	47.9	-2.6		S • O	6.0	1.3	254.2		4.0-	0.4-	1.7	3.6
16.	62.5	-3.5	57.5	8.0-	-0-1	1.3	366	-5.4	-9.5	-4.4	€. • 0 -	4
20.	74.4	-2.5	69 *	4.0-	9	-1.4	459	-1.0	-1.5	7.7	-3.4	ω •
25.	88.1	-1.1	89.5	0.3	-2.0	0.1	565	-6.2	0.4-	F-0-8	ソ・ロー	0
30.	98.1	0.4-	6	-0.8	-1.5	-1.0	999	4.5	-4.3	-1.1	7.B	11
35.	13.	-3.0	133.1	-3.0	e. 0-	1.0	728.7	-7.5	-7.1	۳. د د	10.0	η. α
* 0 *	136.2	-1.1	63.	-1 •0	-3 •2	7	832.3	1.2	æ. 0-	α. Υ.	18.7	11.
	A WAY	ANGLE=	. DEG	•								
-12.	-16.4	8 8	132,3	-2 •6	2.0	3.1	-111.4	8.0	73.4	-5.2	-28.4	13.0
-89	-28.3	-1.9		5.4	0.5	1.0	-118.7	-1.9	101.0	11.0	-28.7	17.
•	-24.1	-10.4	136.5	2 • 5	3.6	0.5	-104.2	-2.9	66	4.5	-18.1	~
•	-16.3	13.3	137,5	0.0-	2.5	-2.6	-81.7	18.1	105.4	-2.5	-26.5	ر.
*	-21.2	3,3	136.6	-1.3	5 • 2	0.8	-86.5	5.8	114.5	-2.2	-32.0	•
8	-27.6	-13.0	•	7.4	7.5	1.6	81.9	-5.6	124.6	6. 0	-37.0	•
12.	-11.6	7.6	139.5	1.8	6.5	0.2	-58.4	12.4	129.5	9.1	-23.5	Ψ.
16.	,	-3.2	•	1.1	8.1	2.8	-63.6	-2.0	136.4	2.5	-17.4	4
20.	-11.7	-11.0	133.4	0.3	7.9	5.0	-38.5	1.6	125.4	۳. د د	-14.2	•
25.	-9-1	-2.0		-1.2	9.8	2.3	-30.1	3.2	121.6	-12.3	-21.4	•
30.	-13.2	-8-4	5.	1.7		6.5	-18.5	-3.6	132.6	2.7	7.0-	٠,
35.	-5.9	-3.6	134.5	0.3	7.6	4 • 2	1.1	6.9	128.0	٥. ١	-R-2	R 6 C F.
40.	•	2.4	4.	-1.7		-1.2	12.3	6.5	131.2	J. J.		• 7



(A) RIGHT SIDE VIEW

- PHOTOGRAPHIC VIEWS OF DS BULLDOZER MODEL



(B) LEFT SIDE VIEW

FIGURE 1. - Continued.



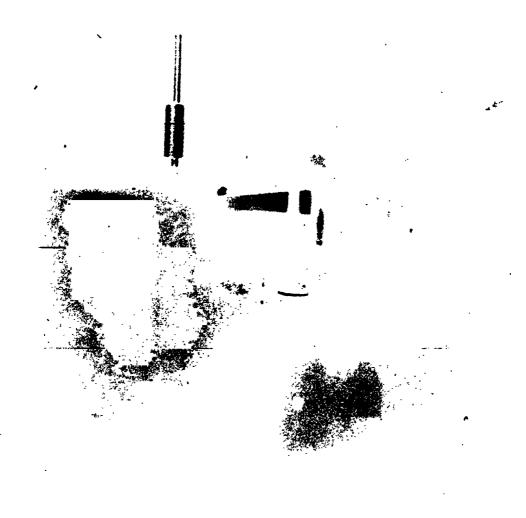
(C) VIEW OF DS BULLDOZER WITH BLADE FIGURE 1. - CONCL'DED.



(A) RIGHT SIDE VIEW FIGURE 2. - PHOTOGRAPHIC VIEWS OF M109 MODEL.

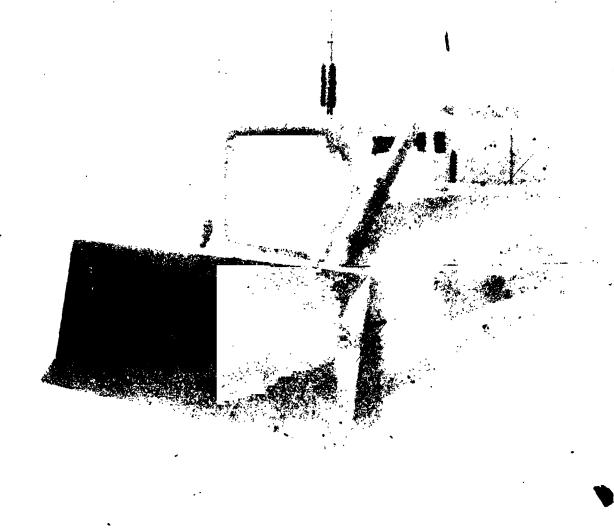
(B) REAR VIEW

FIGURE 2. - CONCLUDED.



(A) DS BULLDOZER MODEL FORWARD CONFIGURATION

FIGURE 3. - D5 BULLDOZER MODEL CONFIGURATIONS MOUNTED IN TUNNEL.



(B) D5 BULLDOZER/BLADE MODEL CONFIGURATION FIGURE 3. - CONTINUED.



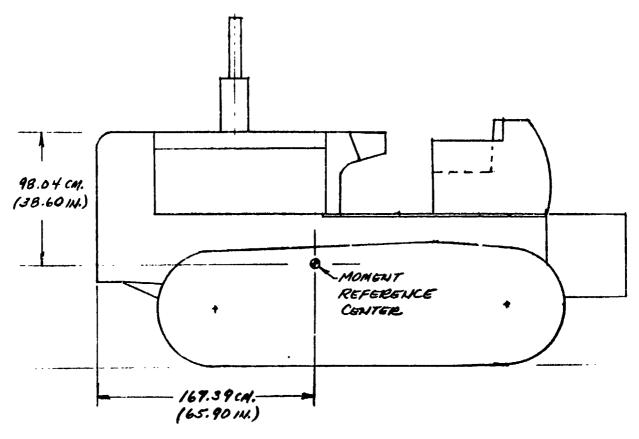
(C) D5 BULLDOZER MODEL REVERSE CONFIGURATION FIGURE 3. - CONCLUDED.



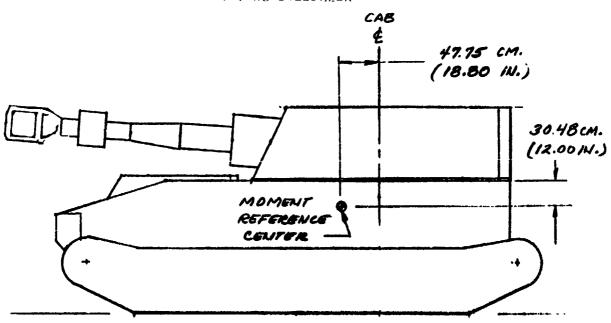
(A) M109 MODEL FORWARD CONFIGURATION

FIGURE 4. - M109 MODEL CONFIGURATIONS MOUNTED IN TUNNEL.

(B) M109 MODEL REVERSE CONFIGURATION FIGURE 4. - CONCLUDED.

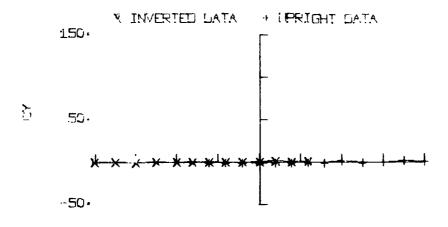


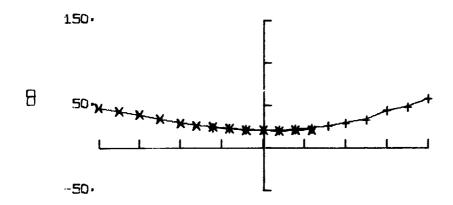
(A) D5 BULLDOZER

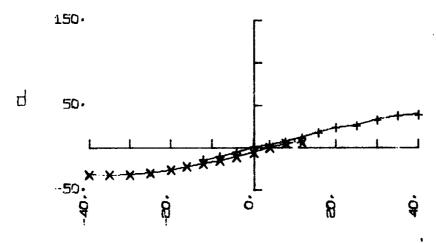


(8) M109 SELF-PRUPELLED 155 MM HOWITZER

FIGURE 5. - LOCATION OF MOMENT & FERENCE CENTER.





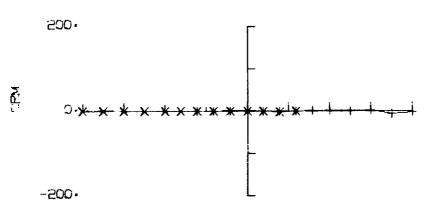


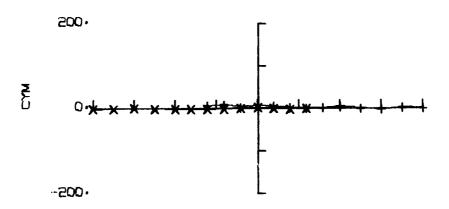
PITCH: ANGLE, DEG.

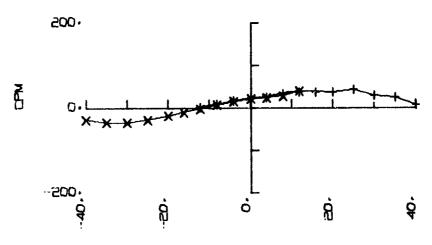
(A) FORCE COEFFICIENTS, YAW ANGLE=0.

FIGURE 6. - AERODYNAMIC CHARACTERISTICS OF CS BULLDOZER FORWARD CONFIGURATION.

X INVERTED DATA + UPRIGHT DATA



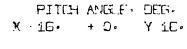


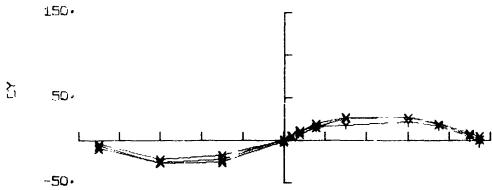


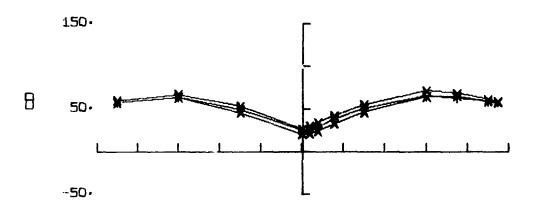
PITCH ANGLE, DEG.

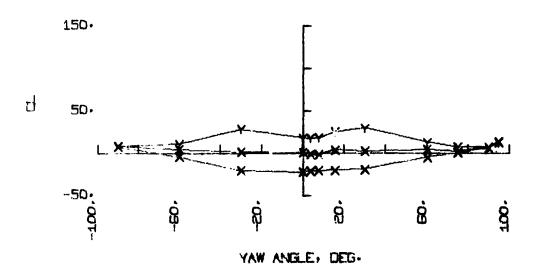
(B) MUMENT CUEFFICIENTS: YAW ANGLE=0.

FIGURE 6. - CONTINUED.



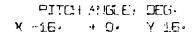


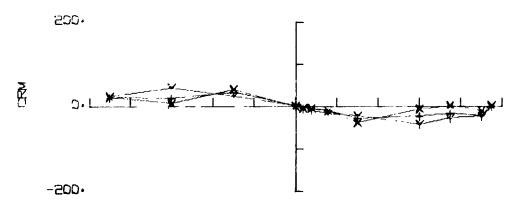


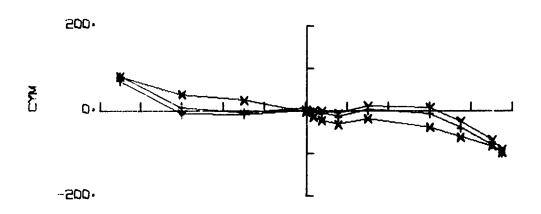


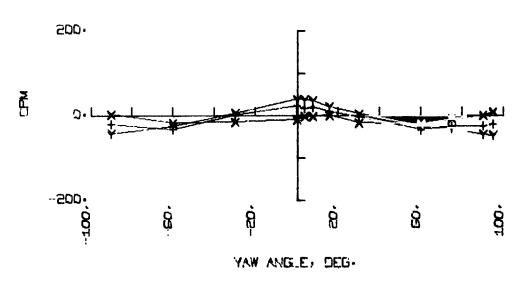
(C) FORCE COEFFICIENTS, PITCH ANGLES=-16.,0.,16.

FIGURE 6. - CONTINUED.





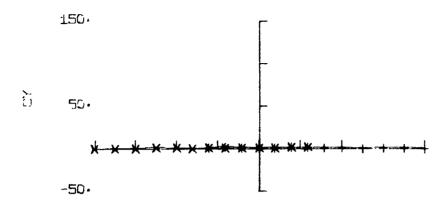


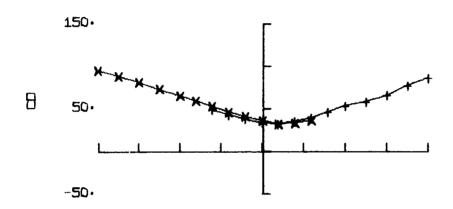


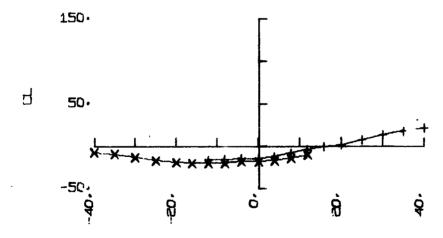
(D) MOMENT COEFFICIENTS, PITCH ANGLES=-16..0..16.

FIGURE 6. - CONCLUDED.







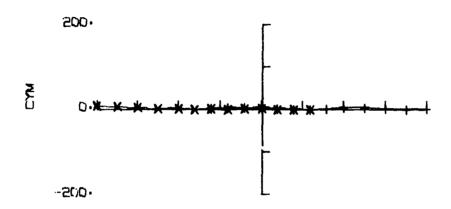


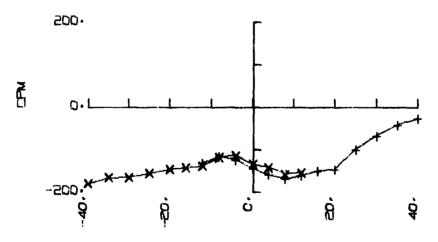
PITCH ANGLE, DEG.

(A) FORCE COEFFICIENTS, YAW ANGLE=0.

FIGURE 7. - AERODYNAMIC CHARACTERISTICS OF D5 BULLDOZER/BLADE CONFIGURATION.

200.
200.
200.
200.



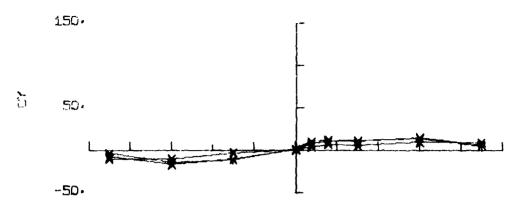


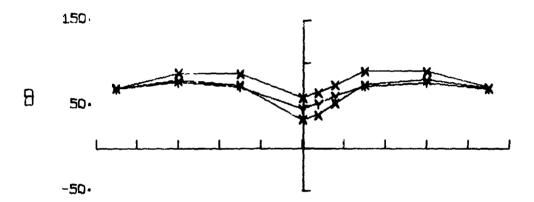
FITCH ANGLE, DEG.

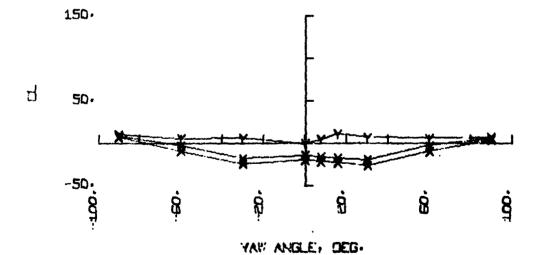
(B) MOMENT COEFFICIENTS: YAW ANGLE=0.

FIGURE 7. - CONTINUED.

PITCH ANCLE: DEG-X -15. + 0. Y 16.



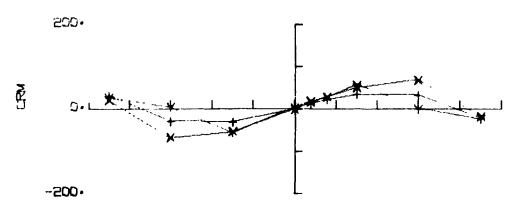


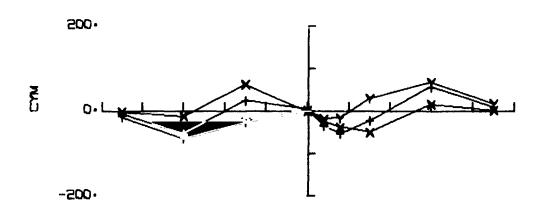


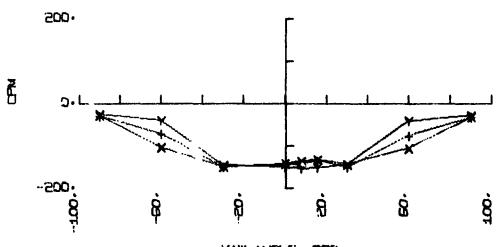
(C) FORCE COEFFICIENTS. PITCH ANGLES =-16.,0.,16.

FIGURE 7. - CONTINUED.

PITCH ANGLE: DEG: X -16: + D: Y 16:





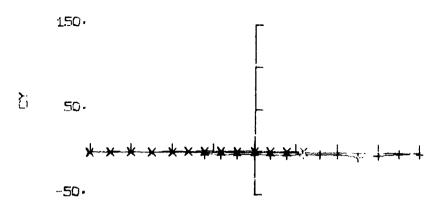


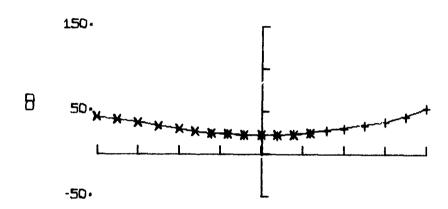
YAW ANGLE, DEG.

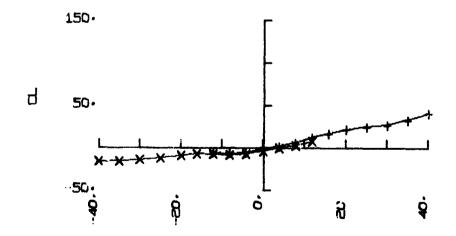
(D) MOMENT COEFFICIENTS, PITCH ANGLES=-16..0.,16.

FIGURE 7. - CONCLUDED.

M INVERSED DATA + LIPRIGHT DATA





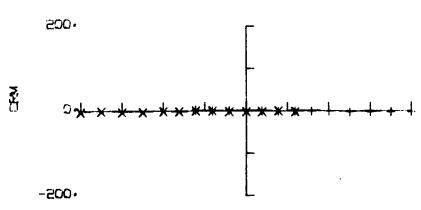


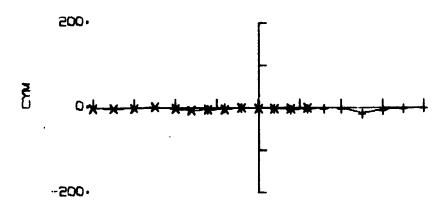
PITCH ANGLE: DEG.

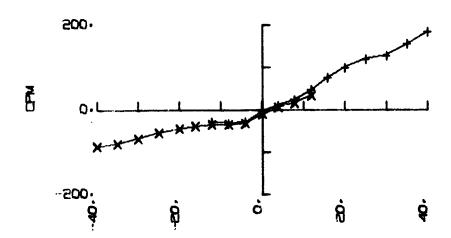
(A) FORCE COEFFICIENTS, YAW ANGLE=0.

FIGURE 8. - AERODYNAMIC CHARACTERISTICS OF DS BULLDOZER REVERSE CONFIGURATION.

X INVERTED DATA + LIPRIGHT DATA





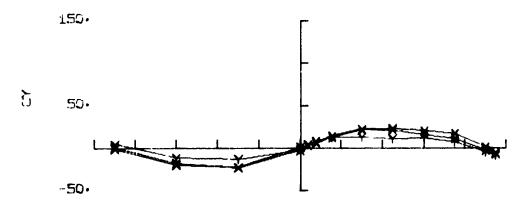


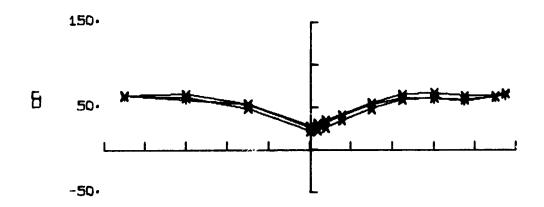
PITCH ANGLE: DEG:

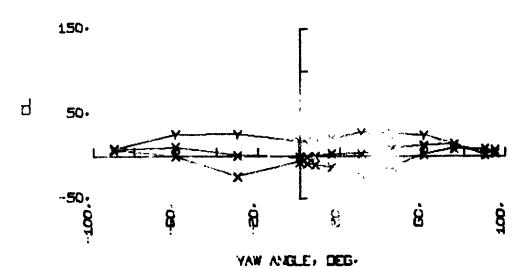
(B) MOMENT COEFFICIENTS: YAW ANGLE=0.

FIGURE 8. - CONTINUED.

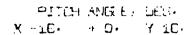
PITCH ANGLE: DEG-X -16: + 0: Y 16:

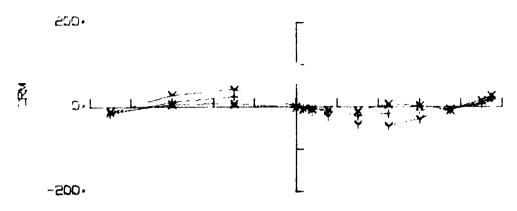


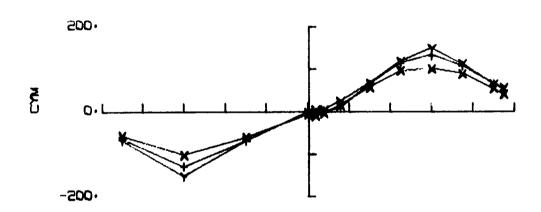


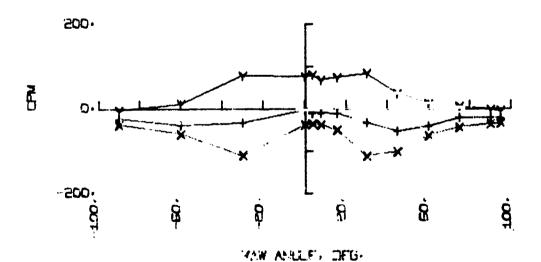


(C) FORCE COEFFICIENTS, PITCH ANGLES=-16.,0.,16.
FIGURE 8. - CONTINUED.



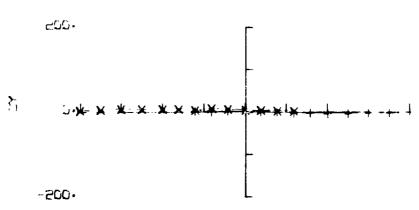


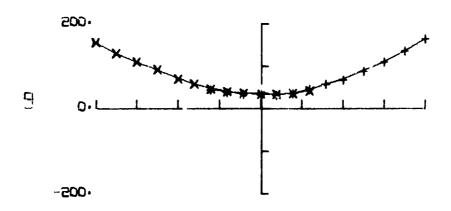


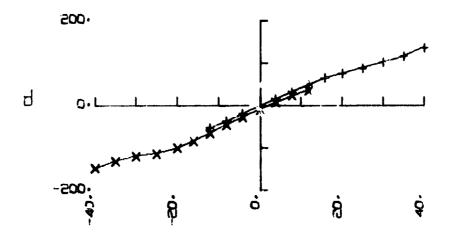


(D) MOMERT COEFFICIENTS. PITCH ANGLES=-16..0..16.
FIGURE 6. - CONCLUDED.

M INVERTED DATA - + (FRIGHT D/)A





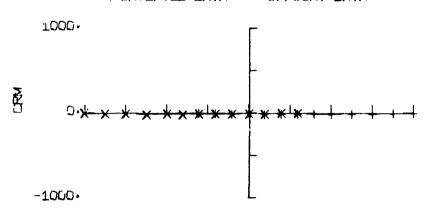


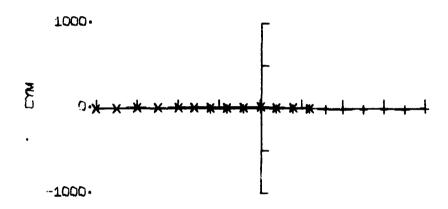
PITCH ANGLE: CEG.

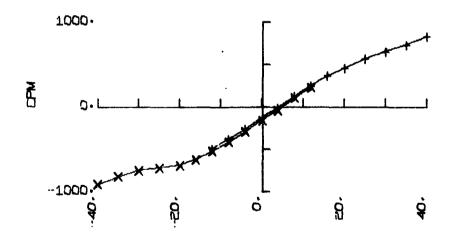
(A) FORCE COEFFICIENTS, YAW ANGLESO.

FIGURE 9. - AERODYNAMIC CHARACTERISTICS OF M109 FORWARD CONFIGURATION.

M INVERTED DATA + UPRIGHT DATA



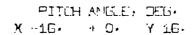


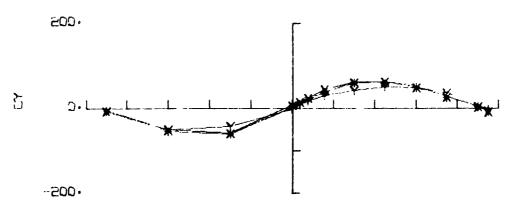


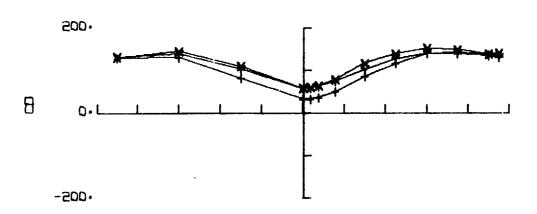
PITCH ANGLE: DEG.

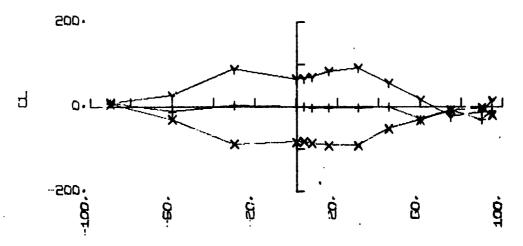
(B) MOMENT COEFFICIENTS: YAW ANGLE=0.

FIGURE 9. - CONTINUED.







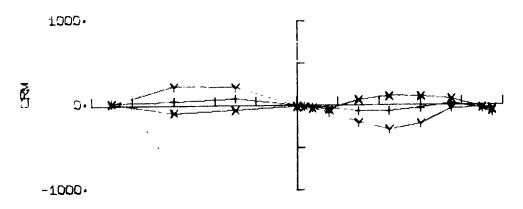


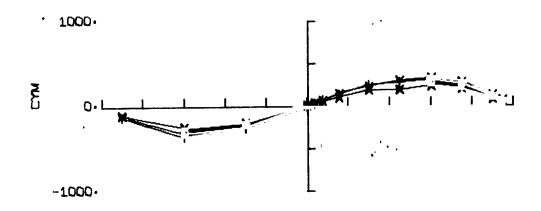
YAW ANGLE: DEE:

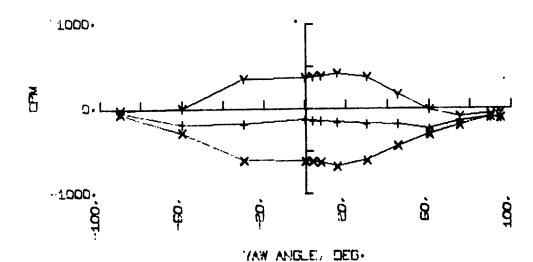
(C) FORCE COEFFICIENTS, PITCH ANGLES=-16.,0.,16.

FIGURE 9. - CONTINUED.

PITCH ANGLE: DEG: X -16: + 0: Y 10:

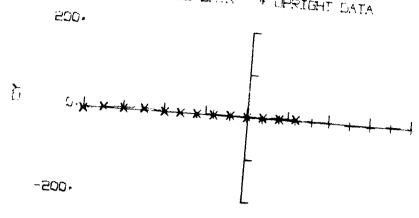


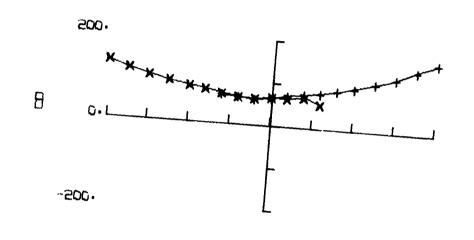


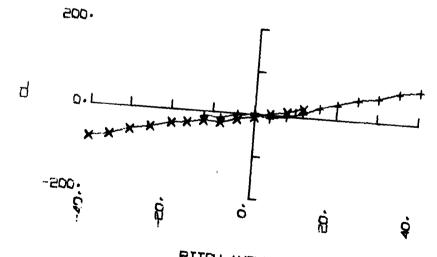


(D) MOMENT COEFFICIENTS, PITCH ANGLES=-16..0., 16.
FIGURE 9. - CONCLUDED.

V INVERTED DATA + UPRIGHT DATA







PITCH ANGLE: DEG.

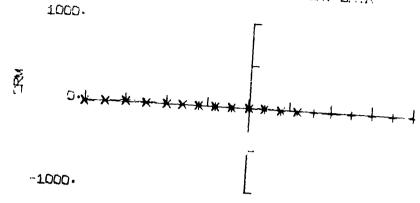
(A) FORCE COEFFICIENTS, YAW ANGLESO.

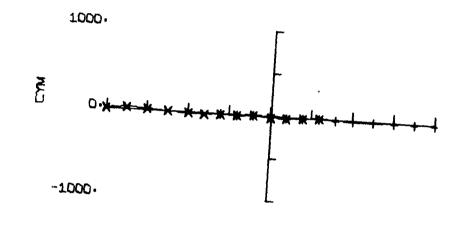
FIGURE 10. - AERODYNAMIC CHARACTERISTICS OF M109 REVERSE CONFIGURATION.

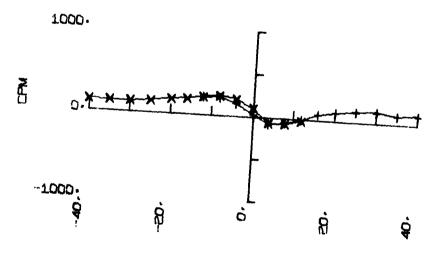
-100-

The state of the s

X INVERTED DATA + LPRIGHT DATA



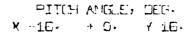


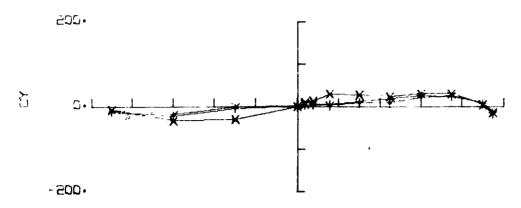


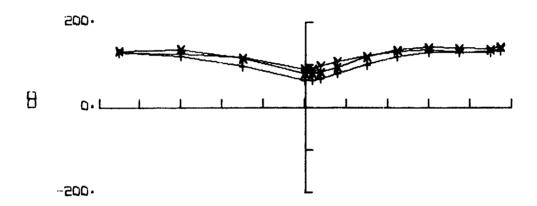
FITCH ANGLE, DEG.

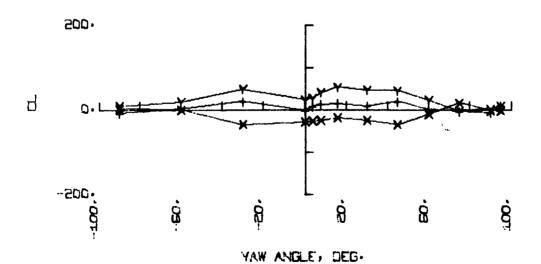
(B) MOMENT COEFFICIENTS, YAW ANGLE=0.

FIGURE 10. - CONTINUED.



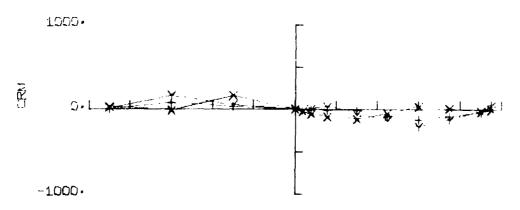


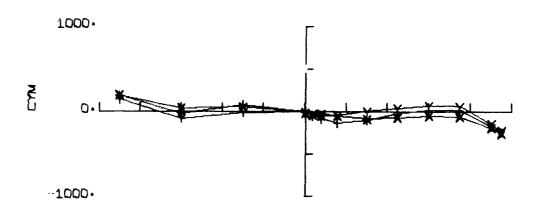


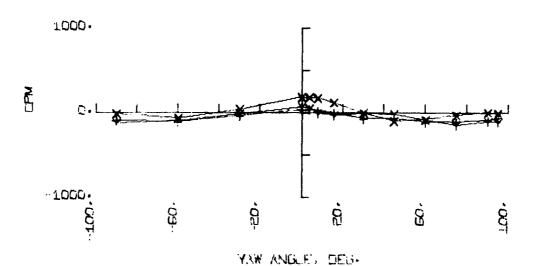


(C) FORCE COEFFICIENTS, PITCH ANGLES=-16.,0.,16.
FIGURE 10. - CONTINUED.

MITCH AND E. DED. X + 10. + D. Y 10.







(D) MOMENT COEFFICIENTS, PITCH ANGLES=-16..0..16.

FIGURE 10. - CONCLUDED.